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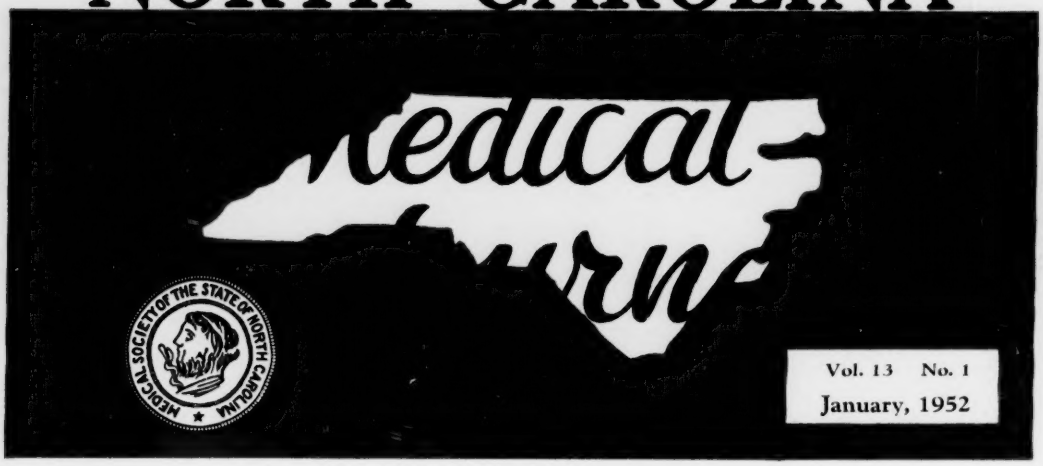

Vol. 13 No. 1
January, 1952

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CORONARY OCCLUSION BEFORE THE AGE OF FORTY — SMITH

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Shigella Dysentery	Pericarditis*	Boutonneuse Fever
Endocarditis*	Psittacosis	Tick-Bite Fever
Erysipelas	Q Fever	Typhus
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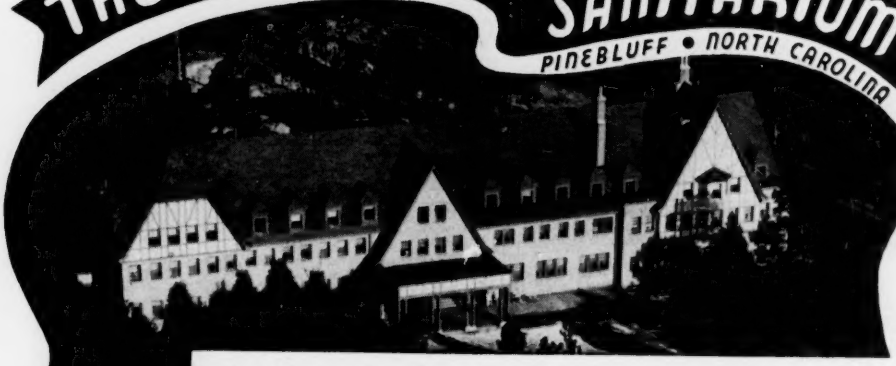

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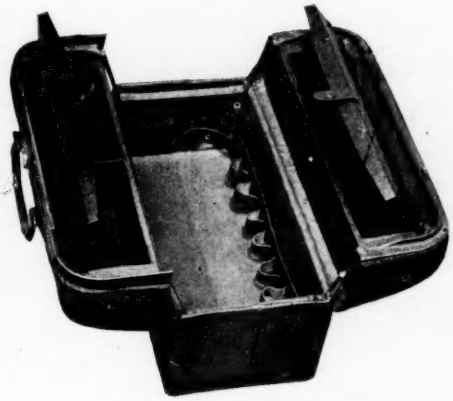

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VOLUME 13
NUMBER 1

JANUARY, 1952

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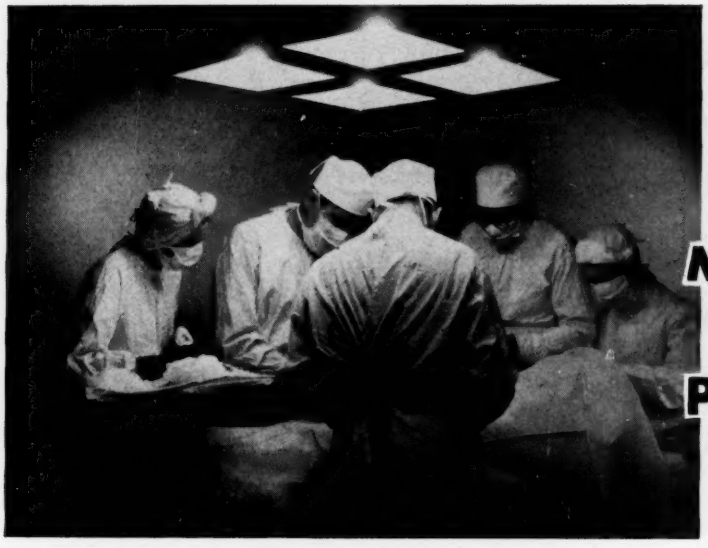

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**J.A.M.A. 146:35, 1951.*

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1. Perloff, W. M.: Am. J. Obst. & Gynec. *58*:684, 1949.

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Meat... Its Place in the Dietary Management of Nephritis

The formerly held tenet that protein intake should be restricted for all patients with impaired renal function, in order to afford the kidney physiologic "rest," is no longer valid.[1] Except for infection and some neoplastic and traumatic disorders, the treatment of renal disease is nonspecific and essentially symptomatic. The clinical problem centers largely on diet regulation, in the hope of stimulating the kidneys to improve impaired function, without unduly risking harm.

Even in the presence of azotemia, a protein intake of 60 to 80 Gm. per day has not been found harmful to the renal patient. Low protein intake, on the other hand, together with urinary loss of protein may encourage the development of asthenia, anemia, hypoproteinemia, and edema.[2] Also pertinent to the dietary management in renal disease is the experimental finding that high protein diets in normal dogs promote higher urea clearance and greater renal blood flow than do low protein diets.[3,4]

Except in anuria, a protein intake adequate to maintain nitrogen balance has been suggested.[1] Although as little as 30 to 40 Gm. of protein per day may suffice for this purpose in the fever-free patient at bed rest, few occasions arise when 1 Gm. of protein per day per kilogram of body weight may not be given safely. In the presence of significant proteinuria, unless specifically contraindicated, the dietary protein may be increased beyond that amount in order to counterbalance the urinary protein loss.

Contrary to the still prevalent ancient belief among the laity, red meats are just as harmless to the renal patient as white meats; nor is there evidence that plant proteins are more beneficial in nephritis than animal proteins. As with the normal person, the dietary protein of the patient should be of high biologic value.

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---

1. Mann, G. V., and Stare, F. J.: Nutritional Needs in Illness and Disease, Handbook of Nutrition, American Medical Association, ed. 2, Philadelphia, The Blakiston Company, 1951, chap. 17, p. 351.
2. Weiss, S.: Diet and Bright's Disease, Connecticut M. J. *5*:496, 1941.
3. Jolliffe, N., and Smith, H. W.: The Excretion of Urine in the Dog: II. The Urea and Creatinine Clearance on Cracker Meal Diet, Am. J. Physiol. 99:101, 1931.
4. Van Slyke, D. D.; Rhoads, C. P.; Hiller A., and Alving, A.: The Relationship of the Urea Clearance to the Renal Blood Flow, Am. J. Physiol. *110*:387, 1934.

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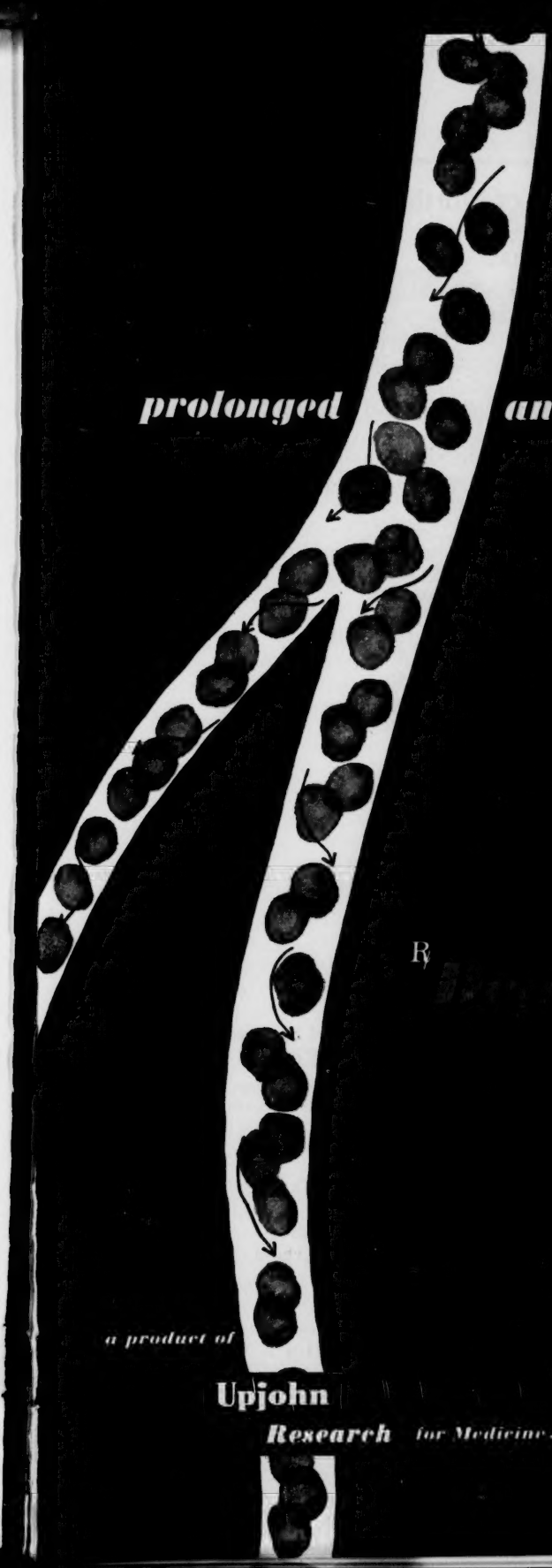

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1. Moss, Henry V., and D'Alessandro, Domenic R.: The intensity and duration of the effect of Depo-Heparin on venous coagulation time in man. Am. Practitioner & Dig. of Treatment 2:509 (April) 1951.

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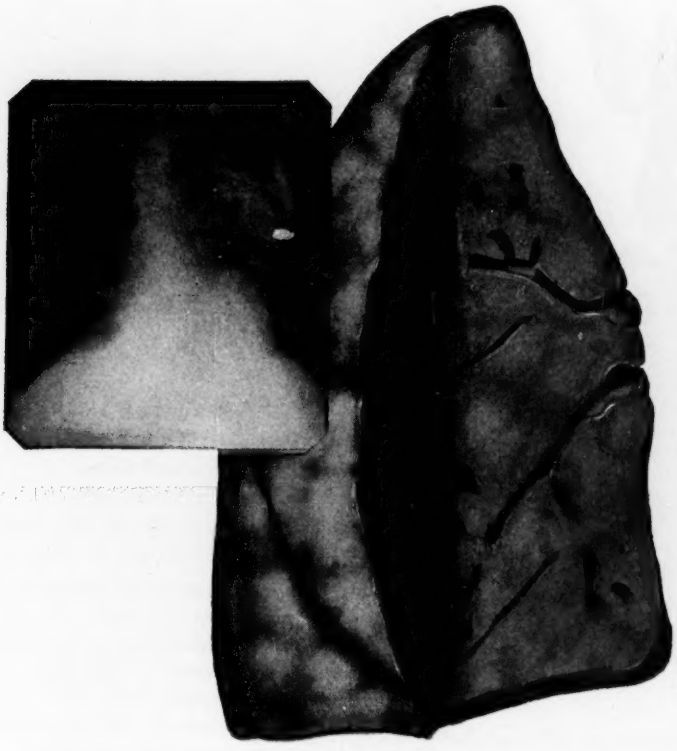

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Potterfield, T. G., and Starkweather, G. A.: J. Philadelphia General Hosp. 2:6 (Jan.) 1951.

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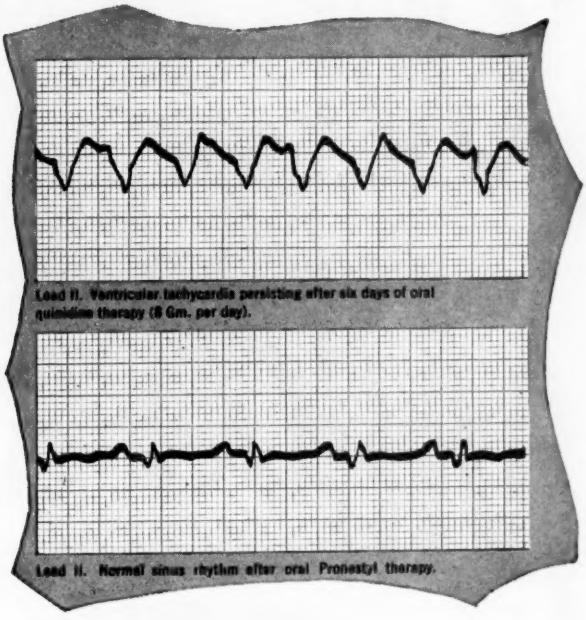

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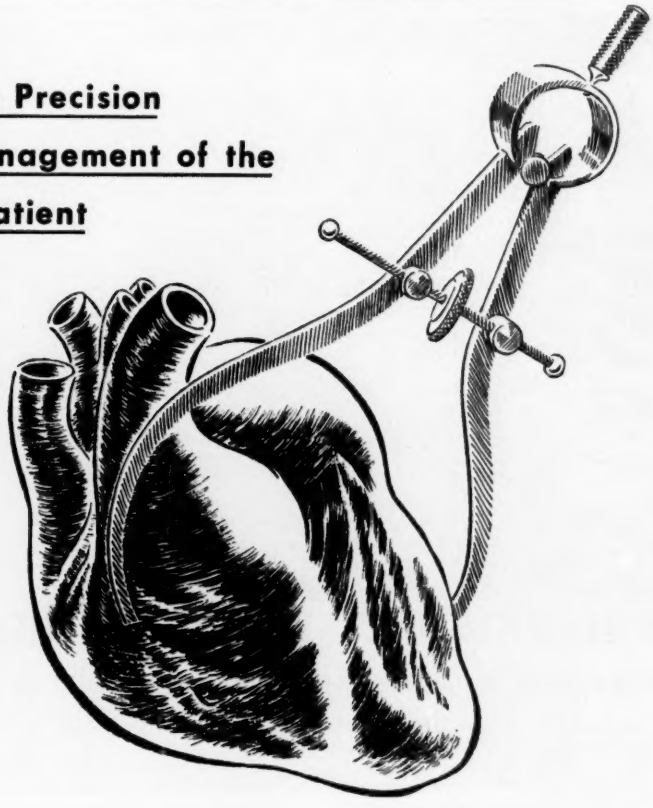

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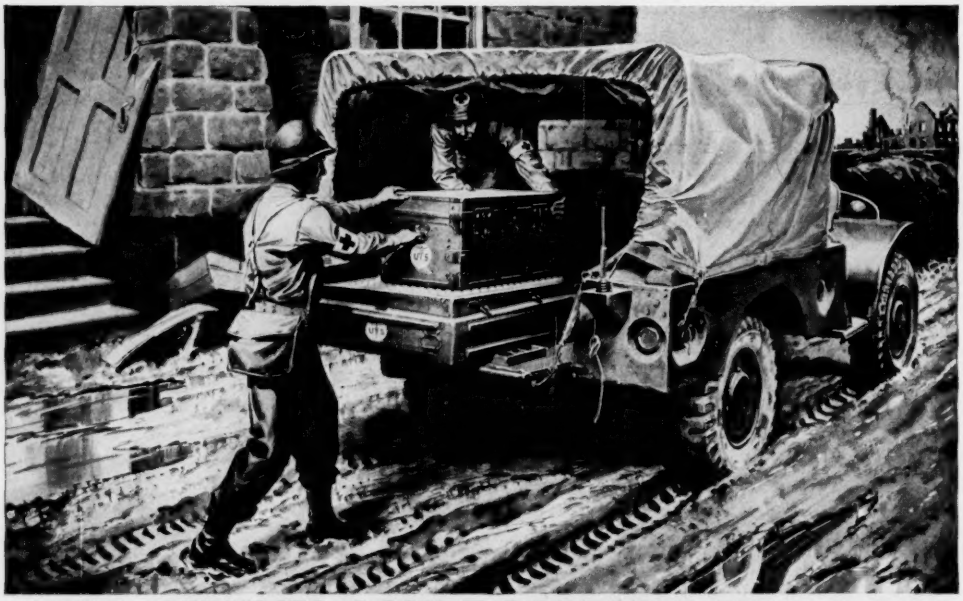

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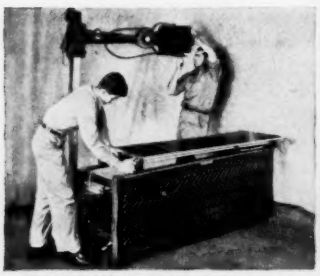

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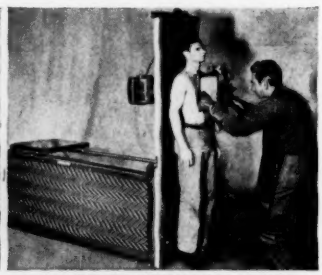

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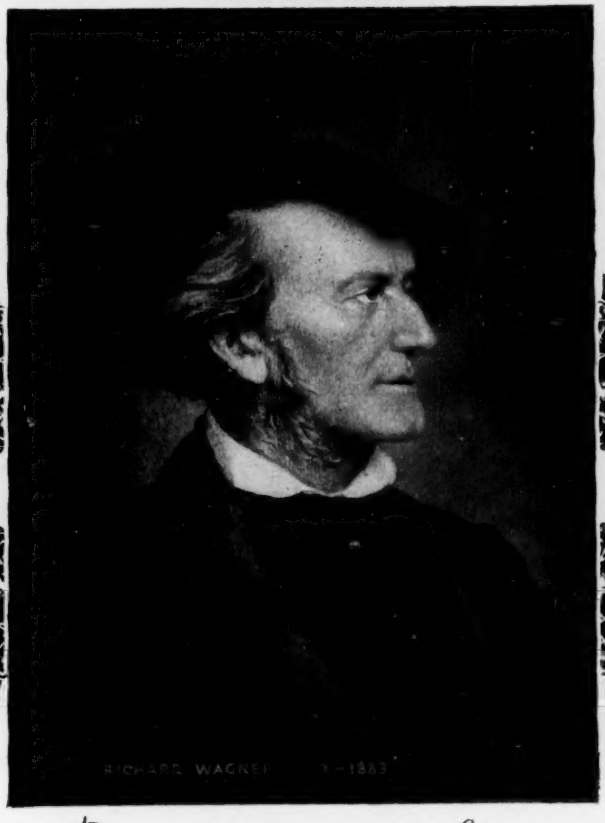

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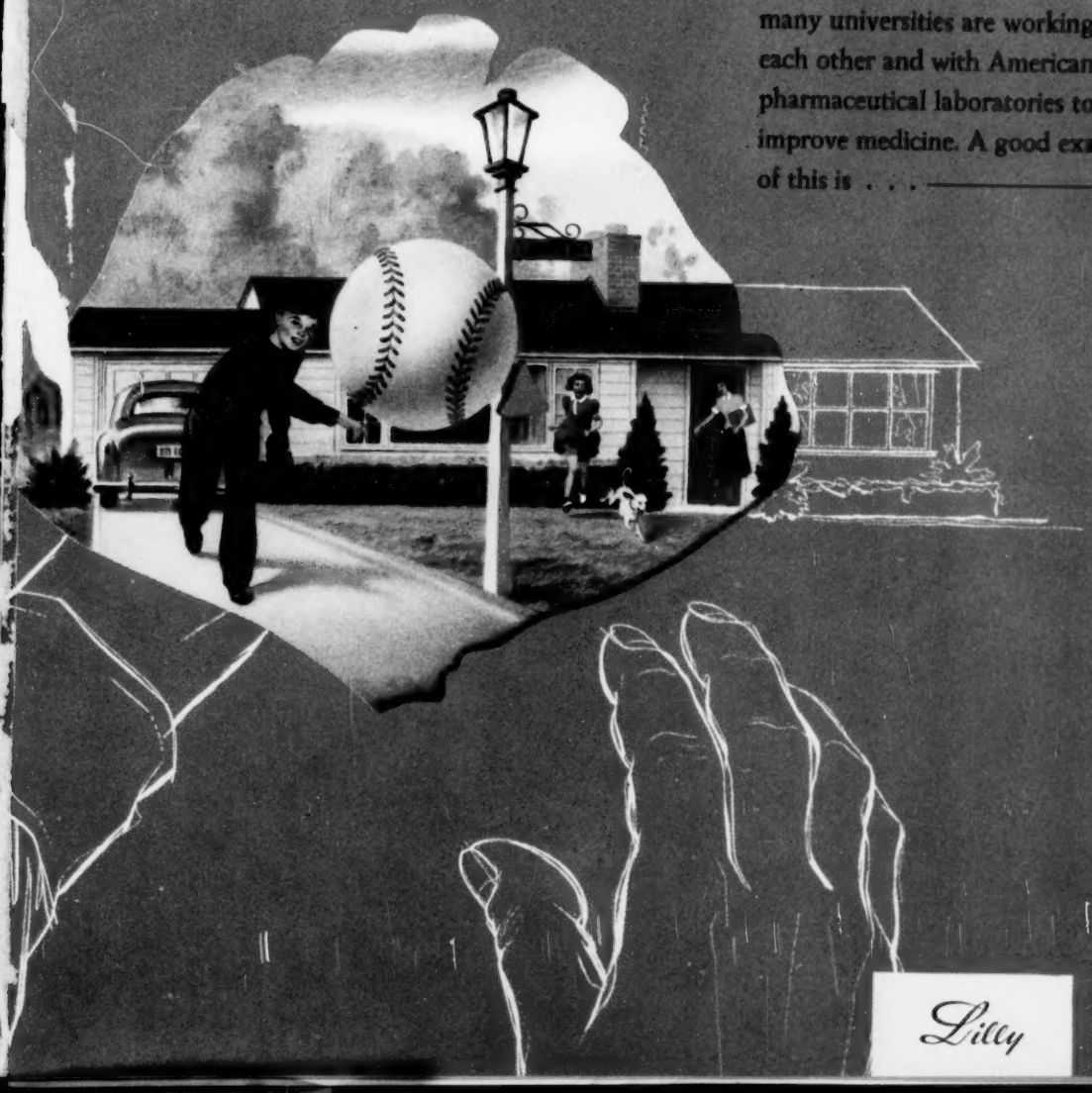

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CORONARY OCCLUSION BEFORE THE AGE OF FORTY

Report of 23 Cases

JOHN G. SMITH, M.D.

ROCKY MOUNT

The death of a 10 year old child from coronary sclerosis[1], or the occurrence of acute coronary thrombosis in childhood or infancy[2], is apt to be regarded as a freak, and the case becomes a collector's item in the literature. Most of us feel that the "coronary age" is between 50 and 75 years, with the peak at about 70[3]. Few of us realize that "probably 5 per cent of the first attacks of acute coronary thrombosis occur before the age of 40."[2]

In an intensive search of the literature, Yater and associates[4] found 78 references concerning a total of 744 patients less than 40 years of age with coronary artery disease, with or without myocardial infarction. To these they added a remarkable collection of 866 patients, 18 to 39 years of age (450 autopsies), taken from Army and Veteran Administration records.

World War II presented a rare opportunity for a study of heart disease in young men, but it must be remembered that many from this group were subjected to stresses unusual and apart from civilian life. It appeared worth while, therefore, to examine the records for cases involving young people in the ordinary walks of life.

Material

For this study, a review was made of over 10,000 electrocardiograms from incases and outcases of a 110 bed hospital connected with group practice. Only patients below the age of 40, having electrocardiograms clearly diagnostic of myocardial infarction, were selected. Rigid criteria, following in general the specifications outlined by Myers and associates[5], were used, the limitations being those common to the day, in our advancing knowledge of electrocardiography.

Twenty-three cases were found to be acceptable for this study, and follow-up personal interviews and examinations were made by the author in 90 per cent of the survivors. Notations from each case were charted under 105 clinical headings representing the items generally given attention in the literature. Only a summary of the most pertinent facts, and their correlation with the literature will be discussed.

Analysis of the Patients

Age, sex, and race distribution

The youngest patient in this group was 25 years of age, and there was one each aged 26 and 29 years, with frequency increasing to the age of 39 (table 1). Eighty-seven per cent of the patients were males, and 13 per cent were females, which is in near accord with the cases reviewed by Yater and associates[4], of whom 95 per cent were males. Thirteen per cent of the present group were Negroes, the literature showing a range of 0.63 per cent[6] to 50 per cent[7]. In the area served by our hospital from which these cases were drawn, the population is approximately 49 per cent Negro. (Occurrence of the acute attack was equally distributed over the four seasons of the year.)

Economic and cultural status

In this study, 56 per cent of the total group were in the upper social strata; 27 per cent attended college, and 69 per cent had education of high school level or higher. Occupa-

Read before the Section on the Practice of Medicine, Medical Society of the State of North Carolina, Pinehurst, May 9, 1951.

From the Boice-Willis Clinic and Park View Hospital, Rocky Mount, North Carolina.

Table 1
Age Distribution in 23 Cases of Coronary Occlusion Below the Age of Forty

Age	No. Cases
25	1
26	1
27	0
28	0
29	2
Total for 5-year period	4
30	0
31	1
32	4
33	2
34	2
Total for 5-year period	9
35	2
36	2
37	2
38	3
39	1
Total for 5-year period	10
Total	23

tion over the 10 year period anteceding the acute attack showed distribution in keeping with that of the local young population at large. Interestingly — and happily — among the longest survivors was an intensely active and conscientious general practitioner; and the only case of sudden death during the acute illness was a WPA inspector (which certainly in this single instance dissociates situational stress from the etiologic factors of survival).

Weight and habits

In a comparison of the young with the old age groups, Glendy, Levine, and White[8] found 70 per cent of the younger group overweight, whereas the study of Yater and associates[9] showed a tendency toward overweight with advancing years. Of the present group, 67 per cent were overweight, about one-third were over 20 per cent overweight, one-third were 10 per cent overweight, and one-third normal or under normal weight; 2 were asthenic, and 4 pyknic.

Twenty-seven per cent of the patients had smoked more than one pack of cigarettes daily for at least five years before their attack, 77 per cent smoked at least one pack, and only 4 per cent did not use tobacco at all. Sixty-three per cent altogether used alcohol; 40 per cent consumed one quart or more a week.

Family histories

A study of the immediate families of this group of patients showed that in 60 per cent of the cases, one or more members of the family had hypertension; in 8 per cent, there had been sudden death; in 15 per cent, diabetes; in 38 per cent, strokes; and in 45 per cent, heart disease. Hypertension seemed to occur in these families at a younger age than usual, although in only 4 of the 20 cases did more than one member of a family have hypertension before the age of 50. None of the 21 patients had had rheumatic fever, or ever been refused insurance on a cardiovascular-renal basis.

Previous Cardiac Symptoms

Regarding the history of cardiac symptoms preceding the acute attack, Yater and associates[9] have stated that in their Army group, the younger patient with coronary disease was more likely to die during his first attack without prior manifestations of cardiac disease than was the older patient. In the present study, 50 per cent of the patients had antecedent symptoms of a cardiac nature, but in only 22 per cent did these symptoms extend back more than three weeks before the acute event. Of these symptoms, pain of the coronary type was predominant. Angina had occurred in 36 per cent of the cases, palpitation in 22 per cent, and dyspnea in 9 per cent of the patients. None had ever displayed signs of cardiac failure. This is in real contrast to the older patients, in whom cardiac symptoms, especially angina, precede the acute event in one third to one half of the cases.

When all ages are considered, hypertension is generally found in one half to two thirds of the patients at the time of their first clinical attack of coronary occlusion[2]; its association is greater with advancing years. In the present study, however, only 35 per cent of the men had prior existent hypertension, with systolic pressures above 150 mm. of mercury, and diastolic pressures above 90 mm. of mercury. Two of the three females had diastolic hypertension, one of whom also had diabetes, while the other had had severe pre-eclampsia gravidarum 15 months earlier. The latter was the only patient showing hypertensive changes of the ocular fundi.

Although there was no evidence of myxedema, xanthomatosis, or nephritis, abnormally high serum cholesterol values were obtained in 24 per cent of the 12 patients on

whom this test was made. Blood serology was negative in all of the 23 patients so examined.

Precipitating Factors

The patient's activity at the time of the acute attack is perhaps the most important feature of the study. What shall we advise our young dynamos whose family histories are set against them, who are early hypertensives, and who want to play as hard as they work? Are we safe in letting them push a lawnmower or put on overalls to build a summer cottage? Our answers vary as do our limited personal experiences. One young and able doctor I know lifts nothing heavier than his bag. Another, now over 60 years of age and one of the country's most experienced clinicians, has a complete physical examination each year and, on the strength of a good report, goes on a vacation, climbs heavy trees, and tops them with his crosscut saw.

Many contributions on this subject have been made to the literature, and opinion seems almost equally divided. Paterson[10] has demonstrated that the formation of coronary thrombi is gradual, and may require several days before occlusion results; unusual exertion or emotion produced sudden increases in coronary blood pressure, resulting in capillary rupture and intimal hemorrhage. Boas[11] concluded that if the hemorrhage was large, occlusion might be immediate; if small or slow, the occlusion might develop slowly or be incomplete, thereby accounting for the occurrence of an acute attack immediately, or several hours or days after unusual exercise or emotion. Yater and associates[4], in their study of young Army men, found twice as many attacks during strenuous activity as the proportion of time spent in such activity.

In the present study, supplementing the recorded histories with personal follow-up interviews of patients and their relatives disclosed that in 27 per cent the acute event began during rest or sleep, in 59 per cent during moderate or habitual activity, and in 14 per cent during strenuous or unusual activity.

Analysis of the patient's activities during the 24 hour period immediately preceding the acute attack, which may be yet more significant, showed excessive emotional stress in 30 per cent of the cases, unusual overeating in 40 per cent, and excessive physical fatigue in 44 per cent. Exposure, trauma, operations, or upper respiratory tract infections were notable in none. Thus, it appears that—certainly on occasion—unusual, immoderate stresses may, especially in the presence of some degree of coronary sclerosis, precipitate coronary occlusion. However, this likelihood is rarely so great that we should interfere with the usual practices of young adults.

Symptoms of the Attack

Symptoms of the acute attack were striking only in that all members of this young group reported pain both as the initial and predominating symptom, rather sudden in onset in over half the instances, and typical in course. The locations at onset were of the usual anterior thoracic variations in all but 2, in whom the pain was epigastric. The severity, distribution, and radiation of pain were not unusual. Shock occurred in 14 per cent of the patients, one of whom died on the second day of the acute onset. Dyspnea was slight in 40 per cent but severe in only 2 patients—one of whom died. Gastrointestinal symptoms were moderate in 40 per cent of the patients, severe in 14 per cent.

The clinical course in the hospital was not significantly unusual from that of other age groups: Congestive failure occurred in only 1 patient (who died); recurrent pain was the principal manifestation, and this occurred in 45 per cent. Cardiac signs on admission were normal in all but 16 per cent of the patients, with cardiac enlargement in only one. Murmurs were present in only 11 per cent, and cyanosis was minimal and rather unusual (15 per cent). Sweating was severe in 10 per cent, and pallor in 35 per cent. The maximal range of temperature was 99 to 104 F., occurring generally on the second to the fourth day, defervescence being complete as a rule by the seventh day. Maximal pulse rates exceeded 120 in only 2 patients, one of whom died; the pulse generally became normal by the seventh to eighth day. The sedimentation time and leukocyte responses were not unusual.

Electrocardiograms

Analysis of the electrocardiograms in this young group showed myocardial infarction of the following types: anteroseptal in 22 per cent, anterior in 18 per cent, anterolateral in 4 per cent, and posterior in 56 per cent, the frequency of these locations being in keeping with that commonly reported

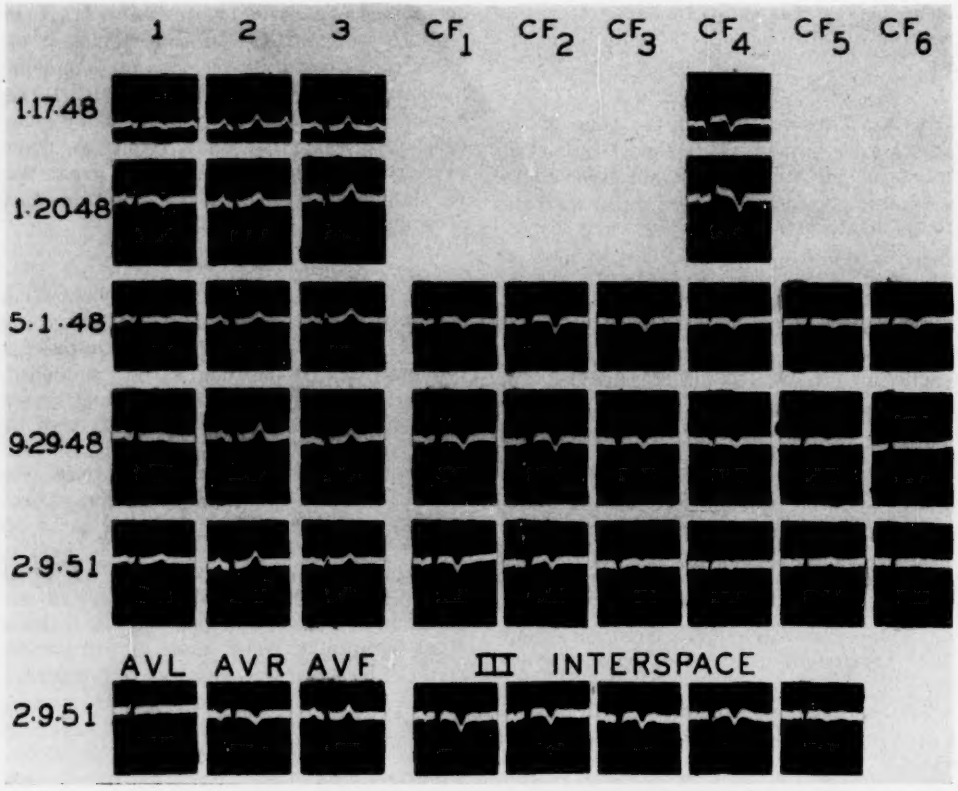

Fig. 1. Electrocardiographic series showing an acute anteroseptal myocardial infarction in the youngest patient in the group, a 25 year old white female. The acute onset occurred January 17, 1948, nine days after prolonged labor and delivery of twins. There was no evidence to justify a diagnosis of coronary embolism. Her blood pressure had always been normal, and the glucose tolerance test was normal. Her marked anemia (red blood cell count 2,050,000 and hemoglobin 42 per cent) may well have precipitated this attack, as it is now known to do in other states with exsanguination. (Gratitude is expressed to Dr. R. M. Whitley, Jr., of Rocky Mount, North Carolina, for permitting the use of some of the initial data in this case.)

for all ages[2]. Figures 1, 2, 3, and 4 show serial tracings from four patients of the group.

Duration of Illness

With regard to duration of illness, 3 of these 23 patients died, giving a mortality rate of 13 per cent for this young group. While in general mortality increases with age of the patient[2], Yater and associates[9] found that in their study of soldiers between the ages of 18 and 39 years, coronary artery disease held a more serious prognosis for men under 40 than for those in the older age groups. One wonders what effect combat and its many fears and uncertainties may have had on these figures.

Master and associates[12] state that young people who recover from an acute attack survive much longer than the older recovered patients, and are more likely to be free from congestive failure and angina. Wolferth[13] found the mortality rate lower for the relatively young group. Glendy, Levine and White[8] reported the prognosis of coronary disease under the age of 40 better by two and one half years than in the average case of coronary thrombosis. McCain[14] in 281 autopsies reported that whereas below the age of 60 the average survival was 93.6 weeks, at 60 and above the average was 57.9 weeks. Of the 3 patients in this study who died, one died on the second day of illness in acute left ventricular failure; the other 2 survived in apparently good health for approximately three years and died suddenly at home (no autopsies).

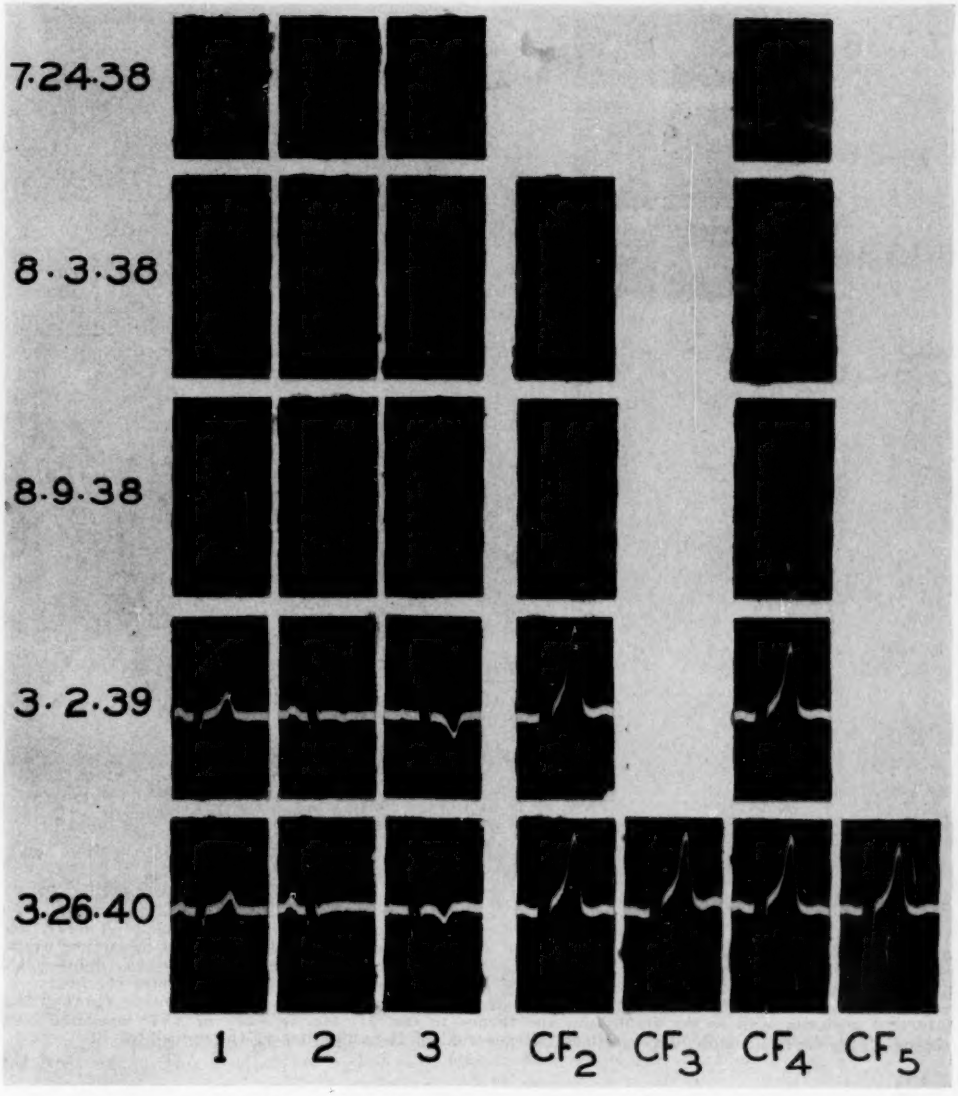

Fig. 2. Electrocardiographic tracings (the most representative of the group) in a 37 year old white male who had an acute posterior myocardial infarction on July 14, 1938. This patient has since had a recurrent posterior lesion on January 17, 1951, from which he is making a good recovery.

Follow-up Studies

Follow-up studies in general showed complete economic and social rehabilitation in 14 per cent of the patients (fig. 5); however, three fourths of the group were considered to be rehabilitated to the extent of 50 per cent or more of their former job capacity, and, more important, had maintained in general their financial and social estates, with, in some cases, enrichment of their outlook on life. This was the next most insistent feature of the study. At the age below 40, few are able to retire. Wage-earning is held almost as dear as life. While at the age of 60 the principal consideration is survival, for the group below 40 years the pressing concern is the ability to earn a living at whatever reduced level and efficiency. It is

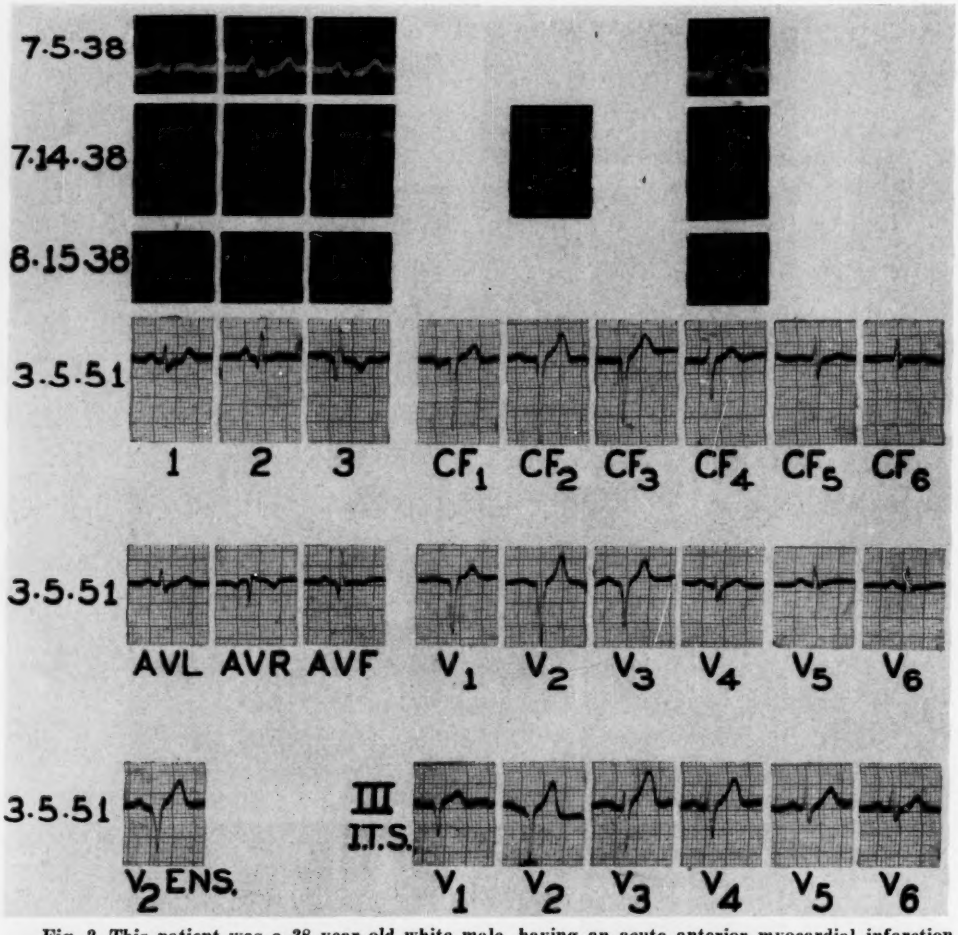

Fig. 3. This patient was a 38 year old white male, having an acute anterior myocardial infarction on July 5, 1938, uncomplicated until August, 1949, when he developed an acute posterior infarction, which was still apparent on March 5, 1951, from the more recently formed Q 3, with posterior diaphragmatic wall involvement indicated by Q-AVF. Lead AVF was especially helpful here, since the heart occupied the more semivertical position, favoring transmission of negative cavity potentials through the infarcted posterior wall to the diaphragm and thence to the left leg. Q wave in AVF measured 0.04 seconds from onset to nadir, and is almost 50 per cent of the amplitude of the associated R.

a disturbing fact that rehabilitation was restricted more by the patient's or physician's apprehension than by symptoms: many patients volunteered the statement that their tolerance to activity was much greater than that allowed, but uncertainty and fear—or their doctor's warning — constrained them. Sixty-two per cent were in Functional Class I, 34 per cent in Functional Class II, and 4 per cent in Functional Class III. Angina of effort, generally mild, was present at some time following myocardial infarction in 38 per cent of the cases. In only one patient was there neurocirculatory asthenia residua, and none displayed the shoulder-hand syndrome. Recurrent infarction had occurred in 1 case by the end of two years, an additional 2 cases by the end of three years, another 2 cases at the eleventh year, and 1 case at the twelfth year, making a total of 27 per cent recurrences for the group.

In urging that we adopt a more optimistic attitude toward our patients who have recovered from myocardial infarction, Leaman[15] has stated that we must teach our

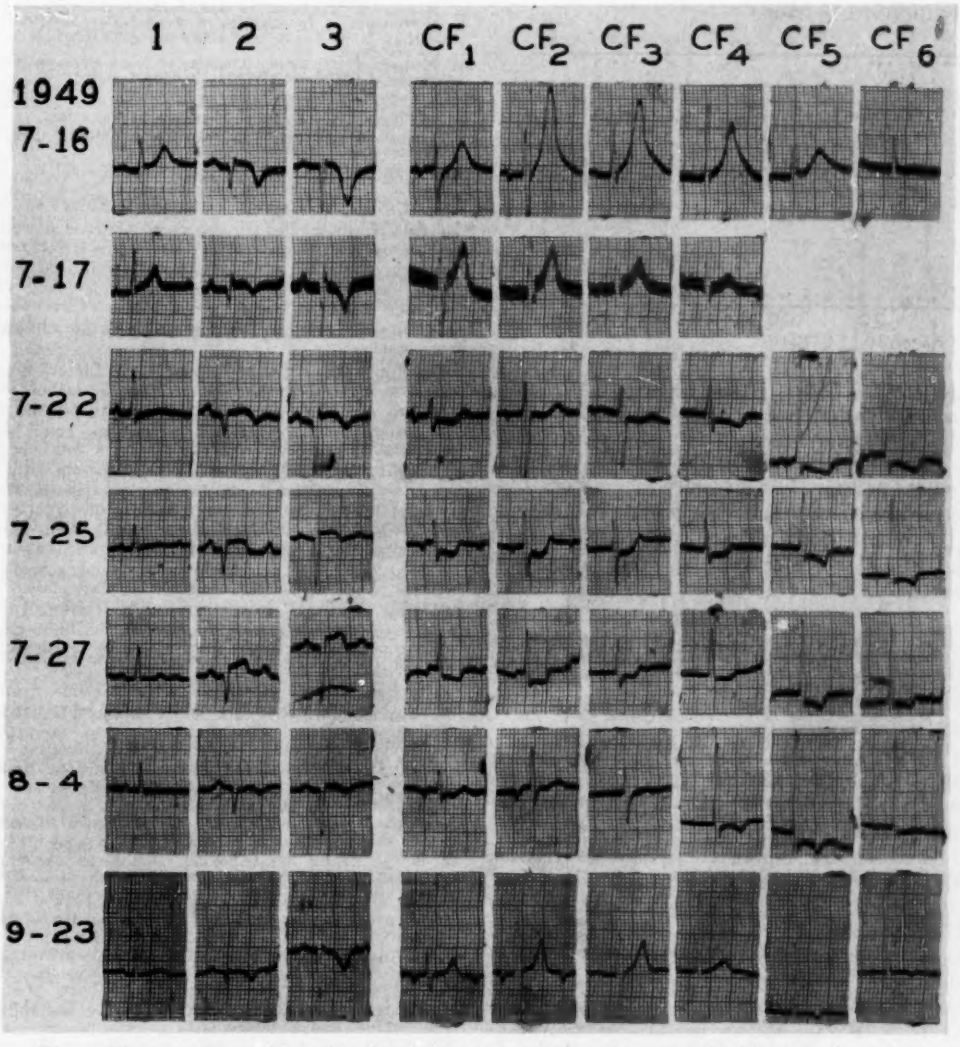

Fig. 4. Electrocardiographic series showing acute posterior wall myocardial infarction in a 34 year old Negro male. The onset of acute clinical symptoms occurred on July 13, 1949.

patients to conquer their fear of activity. By the same token we should study the capacities of our patients who have recovered from myocardial infarction, and especially in the younger age group we should loosen our restraints upon their activities to a degree suitable for their working needs, yet within the threshold of dyspnea, pain, or equivalents, being careful to distinguish the meaningless dyspnea of neurocirculatory asthenia, or precordial "neuralgia," which many of these patients may have.

Summary

In the group below 40, the overweight white male is particularly susceptible to acute coronary occlusion. Occupation, habits, and stresses do not appear as significant as heredity in favoring early occlusion.

The onset of the acute event does not give as much warning, and the crises of the attacks seem better sustained in the younger age groups. Complications are less frequent and severe, rehabilitation is more probable, and longer survival more assured.

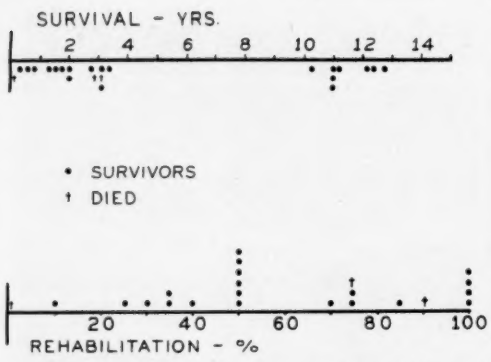

Fig. 5. The upper graph shows the length of survival in each case to March, 1951. The lower graph indicates the per cent of rehabilitation.

In women below 40 who have neither diabetes nor hypertension, coronary artery disease is unusual, but does occur.

A plea is made toward a more liberal and adaptive rehabilitation in this younger group.

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Discussion

Dr. George T. Harrell, (Winston-Salem): From the cold figures, few of us can conceive of the amount of work involved in the review of 10,000 electrocardiograms. It should be stressed that Dr. Smith has personally re-examined 90 per cent of the cases which he uncovered—a rather remarkable percentage of follow-ups for a study in clinical investigation.

Dr. Smith has stressed the etiologic factors concerned in the production of coronary occlusion before the age of 40. Approximately two thirds of the patients were overweight. Even as small an excess as 10 per cent over the standard for height and age is too much, especially in a person with a family predisposition to cardiovascular disease. The strong family history of heart disease or hypertension in these patients emphasizes the need for care in picking one's grandparents. The fact that no seasonal incidence was uncovered would seem to indicate that the factors of work or play played a relatively small part in the series. The low incidence in Negroes is significant, in view of the high percentage of Negroes in the area where the study was conducted.

The fact that 40 per cent of the patients drank one quart of whiskey per week is an interesting etiologic possibility. Alcohol is known to upset the nutrition of the body, especially the utilization of lipides. Diabetes, another disease in which lipide metabolism is upset, with an increased deposition of cholesterol in the arteries, may be a factor of more than passing interest. An unknown element is how much emotional stress, which is also known to be a strong predisposing factor to coronary artery disease, may have played in the ingestion of the alcohol.

The precipitating factors in the majority of the cases were emotion, overeating, and fatigue. All of these factors can be anticipated and prevented. Prevention is the ultimate goal of physicians in dealing with all types of disease. Where predisposing and precipitating factors can be controlled, every effort should be made to prevent the development of serious heart disease. It should be stressed that premonitory symptoms, when present, are the only warning of an impending occlusion. There are no signs in the heart, and no alterations in the blood pressure or blood cholesterol which are dependable in detecting incipient thrombosis.

Dr. Smith has made a real contribution in emphasizing the ultimate good prognosis in the majority of first attacks in this age group. The need for thorough and careful emotional rehabilitation can hardly be over stressed. By nature, these young people do not take well to restriction of activities.

Fundamentally, control of tuberculosis is through education—education of the public to prevent it and education of the patient and those near and dear to him to cure it. The medical profession, the profession as a whole, is primarily responsible for this education.—Edward W. Haynes, M.D., Calif. Med., December, 1950.

PAINS IN THE CHEST— "TRUE OR FALSE"

ROBERT L. McMILLAN, M.D., F.A.C.P.
BOWMAN GRAY SCHOOL
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Although no reliable statistics have been found to prove the point, it is probable that pain is the most common symptom which patients present to the physician. Surely, it is the most important—since the physician's first duty is to relieve pain. The dictionary definition of the word "pain" is as follows:

"Pain is a state of feeling that is the opposite of pleasure." Synonyms which have been used are: Ache, affliction, agony, anguish, discomfort, distress, misery, pang, suffering, throe, torment, torture, trouble, twinge, uneasiness, woe, or wretchedness.

From my experience with patients who complain of pain in the chest, I would add to these synonyms "tightness, constriction, pressure, weight, hurt, pressing, bearing-down, and choking." Because of the obvious difficulties of describing and defining pains in the chest and because the individual reaction to pain is notoriously inconstant, patients' descriptions of chest pain are often confusing to the practitioner.

It is well recognized that the most common cause of pain in the chest which has any serious consequence is disease of the coronary arteries. Chest pain due to this cause will be referred to as "true." Many organic lesions and inorganic disturbances of function may also produce pains in the chest which are seldom serious but which require explanation in order that effective treatment may be rendered. In contrast to pains due to coronary artery disease, these pains will be referred to as "false."

Again the dictionary is helpful. "True" is defined as "faithful, honest, just, actual, genuine, factual, correct, to be relied upon, exact, accurate, and conformable to a rule or pattern." "False" is defined as "untruthful, dishonest, not faithful or loyal, untrue, treacherous, counterfeit, artificial, feigned, not essential or permanent, and not in tune and wrong in pitch."

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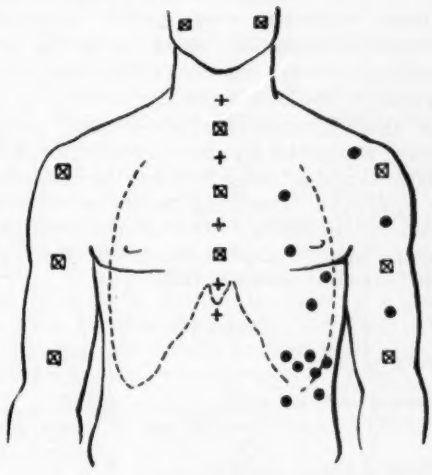

● Areas in which pain is proved to be "false."

+ Areas in which pain may be due to coronary disease but which must be further studied.

⊠ Areas in which pain frankly indicates coronary artery disease.

Figure 1.

True Chest Pain

Location

Studies of patients with pain in the chest have led to the observation that true pain commonly is felt in the mid-line, anywhere from the navel to the nose. The most common location, however, is beneath the sternum. The pain is often localized, but may radiate to the left arm or both arms. Substernal pain radiating only to the right arm frequently indicates coronary disease, but substernal pain radiating to both arms is almost pathognomonic of coronary disease. Such a pattern might be produced by a tumor of the upper dorsal or cervical spine or by compression of the spinal cord from fracture, bone destruction, or a displaced intervertebral disk; but these disorders are quite rare and are usually associated with demonstrable motor and sensory changes. No demonstrable sensory changes are produced by coronary artery diseases *per se*. When mid-line pain—usually substernal but occasionally epigastric—radiates to the jaws, shoulders, upper arms, forearms, elbows, or wrists, on *both* sides, painful disease of the coronary arteries is almost always the cause.

Causes

There are two types of painful coronary artery disease: (1) coronary insufficiency, which results in angina pectoris: and (2)

coronary occlusion, which usually produces myocardial infarction. These occlusions are practically always due to a thrombosis of a previously diseased coronary artery. It is true that coronary thrombosis may occur without producing myocardial infarction, and that myocardial infarction may be produced by prolonged myocardial ischemia without coronary thrombosis. The clinical and laboratory findings which differentiate these two conditions are shown in table 1.

Table 1

Symptoms and Findings	*Angina Pectoris*	*Myocardial Infarction*
Location of pain	Mid-line	Mid-line
Type of pain	Dull, oppressive, squeezing, aching, burning, mild	Sharp, knife-like, crushing, often remitting, severe
Radiation of pain	Shoulder, left arm, neck, often to both arms, occasionally to one or both elbows or wrists	Same
Duration of pain	Minutes	Hours
Time from onset to request for medical aid	Months	Hours or minutes
Past history of similar pain	Frequent	Rare
Relation to exercise	Produced by effort	Exaggerated but not produced by effort
Effect of rest or nitroglycerin	Commonly gives relief	No effect
Relation to overeating or emotional disturbance	Common	Rare
Nausea and vomiting	Rare	Common—"acute indigestion"
Dyspnea	Frequent but temporary	Almost constant and of long duration
Sweating	Occasionally present	Almost always present
Shock or collapse	Rarely present	Commonly present
Blood pressure	Normal or elevated	Often low, but may be increased for several hours after the attack only to drop later
Pericardial friction rub	Never present	Frequently present on second and third days
Diastolic gallop rhythm	Rarely present	Frequently present for two or three days
Pulmonary congestion	Rarely present	Commonly present
Fever	None	Almost always present on second to fifth days
Leukocytosis	None	Commonly present
Elevated sedimentation rate	None	Almost constantly present
Electrocardiographic changes	Transient, mild, fixed, or absent	Progressive in serial records—rarely absent
Reproducibility of symptoms	Always reproducible	Never reproducible

The differentiation of these two types of painful coronary artery disease is important, because patients in the angina pectoris group should always be treated as ambulatory unless their angina is severe enough to prevent any physical activity. On the other hand, patients severely ill with myocardial infarction demand bed rest, and—if possible—should be hospitalized immediately and given anticoagulant therapy. Coronary occlusion constitutes a medical emergency.

False Chest Pain

Characteristics

The importance of recognizing and treating patients with true pain in the chest is immediately apparent. It is equally important, however, that patients with false pain not be reduced to a state of invalidism. These patients also have pain in the chest, but inquiry shows that the pain is in the left side—radiating to the left axilla, beneath the left costal margin, and occasionally into the left subclavicular region, the left shoulder, and the left arm. The pains are often felt after the patient lies down at night, are not brought on by exertion, are short and sharp or dull, and intermittent, are worse when the person is nervous, are relieved by passing flatus or belching, are frequent in females without hypertension (who almost never have coronary artery disease), are not constant in location, severity, or duration, and may disappear completely for days or weeks only to return for like periods. It is significant that the patient cannot produce this type of pain by any action or maneuver. It comes on spontaneously, and almost always is worse when the patient is most nervous. This history is in contrast to the producible, measurable pain of the patient with definite angina pectoris. Treatment with antispasmodics such as belladonna or atropine and measures to combat constipation frequently relieves these patients with false chest pain. Reassurance that they have no heart disease is of the utmost importance.

Cause

Experiments with pain have been confined to human subjects, and consequently have been limited. Multiple efforts with laboratory animals have failed for the obvious reasons that animals cannot describe their feelings in words. In an effort to delineate the false type of chest pain, we have passed tubes to the splenic flexure of the colon and injected air in 12 patients known to be without coronary artery disease. The location of pain produced in these subjects is most interesting and informative. In no case was there pain in the mid-line or bilaterally, but all the patients complained of pain in the left chest, and 6 stated that the pain radiated into the left axilla and left arm. Similar re-

sults were obtained by passing air into the stomach.

Differentiation of True and False Chest Pain

Figure 1 shows diagrammatically the location of chest pain in more than 100 patients with proven coronary artery disease and more than 100 patients found to have no heart disease who were studied clinically and in some cases at autopsy as well. There were a few patients with definite coronary artery disease who felt their greatest pain in the precordial region, but in these cases substernal or bilateral pain was present also. The patients whose pain was confined to the left side of the chest were mainly below the age of 50. Almost all of them had problems of stress or discontentment. The pain was not produced by effort, and naturally was not relieved by rest. Besides being restricted to the left chest, the pain did not follow a consistent type or pattern, and did not have a definite location.

The following conditions should always be considered in the differential diagnosis of chest pain: pneumonia, pericarditis, pancreatitis, pneumothorax, hiatus hernia, pulmonary embolus, dissecting aneurysm of the aorta, mediastinal emphysema, mediastinal lymphadenitis, and trauma. These may usually be ruled out by the physical examination, history, x-ray, and electrocardiograph. Hiatus hernia has been difficult to diagnose on the basis of the history, being most frequently found in patients without symptoms and seldom demonstrated by x-ray in patients who present the so-called typical symptoms.

Conclusions

1. Mid-line chest pain with or without radiation strongly suggests myocardial infarction or angina pectoris.

2. Mid-line pain with bilateral radiation should always be considered indicative of angina pectoris or myocardial infarction.

3. Reproducibility, repetition, and constancy of the pain pattern are characteristic of angina pectoris.

4. Chest pain in women under 50 without hypertension is almost never due to coronary artery disease.

5. Unilateral left-sided pain which is not substernal is only rarely due to coronary artery disease.

6. False chest pains are not reproducible, and occur quite often at night.

7. There is no consistent pattern characteristic of false pain.

8. Evidences of an anxiety state are almost invariably present in patients with false pain.

9. False pains can usually be relieved easily by reassurance and the administration of a mild soporific and an antispasmodic such as belladonna.

10. The administration of nitroglycerin is not valid as a therapeutic test for angina pectoris, because it commonly relieves spasm in the gastrointestinal tract as readily as it relieves angina.

11. The majority of false pains are due to spasm, and to gas in the colon, stomach, or duodenum.

12. False pains are common even in patients with known coronary disease, and must be recognized and treated.

13. The correct differentiation of true and false chest pain will result in the proper therapy of those ill with coronary artery disease and will prevent the creation of innumerable cardiac neuroses.

SOME COMPARISONS OF NEUROPSYCHIATRIC CASUALTIES IN RECENT AMERICAN WARS

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and
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DURHAM

Before we attempt to compare neuropsychiatric casualties of recent American wars, let us avail ourselves of the perspective which can be obtained by a brief consideration of the neuropsychiatric casualties of the major wars of which we have historical records.

Since the time of Alexander the Great, and perhaps even earlier, great military leaders have been interested in and concerned by what we now call neuropsychiatric casualties. Just when Alexander, the first great military genius of the ancient world, had reached the height of his power, and was virtually unopposed in his determination to conquer the world, his weary veterans,

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who had reached the limit of their endurance, mutinied and forced their young leader to turn back in acknowledgment of his first defeat[1]. Citizen soldiers who were brought into Caesar's legions as replacements lacked the soldierly characteristics of his professional soldiers who had been indoctrinated from childhood, and had to be given higher pay and permission to loot and rape as inducements to fight. The Chinese kings and princes of the time of Confucius believed that "Good iron is not used for nails, nor are soldiers made of good men." These Chinese leaders used only the illiterate and feeble-minded who had never enjoyed any privileges, and who could be forced to fight out of fear of their leaders. Frederick the Great said, "If my soldiers began to think, not one would remain in the ranks." He also said that "since officers have to lead soldiers into great dangers, soldiers must be more afraid of their own officers than of the dangers to which they are exposed." Napoleon was perhaps the first of the great military leaders to attempt to imbue his soldiers with fighting spirit by building up morale and esprit de corps. Wellington contemporaneously was creating a system of military leadership which was uniquely successful in dealing with citizen soldiers.

Prior to the eighteenth century religious fanaticism undoubtedly was a major factor in preventing neuropsychiatric casualties. The replacement of religious fanaticism by national fanaticism—with the exception of Nazism, and the combination of religious and national fanaticism in the Japanese Army in World War II—rendered conscript armies subject to neuropsychiatric disorders. However, from the time of Napoleon through the Boer War in 1898, the communicable diseases so often decimated field armies that neuropsychiatric casualties played an insignificant part.

The Development of Military Psychiatry

The first mention of neuropsychiatric casualties in the history of war occurred in 1905 during the Russo-Japanese War. In this war, for the first time in the history of the world, mental diseases were separately cared for by specialists in nervous and mental disorders[2].

The Russians reported 3,500 neuropsychiatric casualties during this war. The load was so great that the Russian Medical Service had to call on the Russian Red Cross for assistance. Most of the neuropsychiatric casualties are said to have been depressive in character. Fear of the comparatively harmless gas bombs of the Japanese is said to have been the principal cause.

The United States Army first became aware of the potential seriousness of the neuropsychiatric problem when, in 1912, it was discovered that 20 per cent of the disability discharges from the peacetime United States Army were due to mental illnesses. In 1916, the hospital admission rate for mental diseases among United States troops guarding the Mexican border was three times as high as the admission rate for these disorders in the adult male population of New York State. Prior to 1917, there was a small number of medical officers in the U. S. Army who were recognized as having a knowledge of psychiatry, obtained, for the most part, during periods of service to which they were detailed at Saint Elizabeth's Hospital for the insane in Washington, D. C. However, with the exception of service at the Letterman General Hospital and at the U. S. Disciplinary Barracks at Fort Leavenworth, Kansas, these officers were not utilized as neuropsychiatrists[3].

As reports concerning the alarmingly high incidence of neuropsychiatric casualties began to filter in from Europe, the Surgeon General became concerned, and, in March, 1917, invited a group of civilian psychiatrists to serve on a committee to help organize and develop psychiatry and neurology in the United States Army. Drs. Stewart Paton, Pearce Bailey, and Thomas Salmon composed the committee. As a result of their efforts, the division of neurology and psychiatry was organized in the Surgeon General's office on July 19, 1917. In January of 1918, the War Department created the position of Division Psychiatrist, carrying the rank of major, for every combat division. At this same time, arrangements were made to give young medical reserve corps officers coming into the Army a six-weeks training course in neuropsychiatry.

Significant Factors

Having summarized some of the historical high lights pertaining to neuropsychiatric casualties in war and the development of military neuropsychiatry, we shall now mention some of the factors which are generally recognized as influencing the incidence of neuropsychiatric casualties in land armies:

1. The employment of citizen soldiers rather than professional or mercenary soldiers has confronted military leaders with the problem of dealing with men who consciously, unconsciously, or both, have strong wishes to escape from the hazards and ordeals of combat and other unpleasant aspects of military life.

2. Effective screening of potential soldiers will, to a great extent, determine the ratio between soldiers predisposed to neuropsychiatric disorders and those who are not predisposed, but unfortunately, no really practical method of doing this has so far been devised.

3. The proper assignment of individuals in the military service according to their capacities, limitations, and predispositions would undoubtedly help prevent neuropsychiatric casualties, but this is extremely difficult and sometimes impossible to carry out in a democratic society, which has to mobilize large numbers of men in a very short period of time.

4. Public support or disapproval of the war is reflected in the attitude and behavior of the soldiers, and in their susceptibility to nervous and mental diseases.

5. The quality of civil and military leadership can have an inspiring or demoralization effect on troop morale.

6. From the standpoint of both training and equipment, the ability of troops to defend themselves and accomplish their mission, is likewise an important factor.

7. The nature of the fighting, a term which includes many and varying factors, has tremendously affected the effectiveness of the combat soldiers in all wars.

8. It was not until World War II that U. S. military leaders learned the importance of rotating troops out of front line or other hazardous duty before the prolonged strain caused them to reach the breaking point.

9. The occurrence of intercurrent diseases and injuries influences the incidence of neuropsychiatric casualties. It has long been recognized that the wounded soldier seldom shows signs of neuropsychiatric disorder while in forward hospitals. Both in World War II and in Korea, neuropsychiatric rates went down when cold injury rates went up.

10. The soldier's belief in the likelihood of success, failure, or stalemate does much to determine whether or not he will become a psychiatric casualty at that particular time. This was especially noticeable during the trench fighting in World War I, and more recently in the mountain fighting in Italy, the hedgerow fighting in Normandy, and in Korea.

Comparison of Casualties in World Wars I and II

The unreliability of the published statistics, which is due to the many variables incident to their compilation, tends to vitiate any effort to compare specifically neuropsychiatric casualties of recent American wars. However, certain statistics seem to be relatively valid and pertinent.

Rejections

During World War I, 3,500,000 men were examined by neuropsychiatrists at mobilization centers, and 69,394 were rejected for neuropsychiatric disorders. This represents a rejection rate of approximately 11 per cent. During World War II, a little more than 15,000,000 men were examined at the induction stations, and 1,850,000 were rejected for neuropsychiatric disorders. This represents a rejection rate of approximately 12 per cent. In each of these wars, mental deficiency represented about 33 per cent of the rejections, psychoses only 1 per cent, psychoneuroses about 25 per cent, psychopathic personality 15 per cent, with other psychiatric and neurologic diseases making up the remainder.

Military hospital admissions

During World War I there were approximately 100,000 hospital admissions of neuropsychiatric patients over a period of two years and eight months. During World War II, there were approximately 1,000,000 hospital admissions of psychiatric patients over a period of three years. Taking into consideration the number of men in the Army in each of these two wars, the number of troops actually engaged in combat in each war, and the fact that in both wars neuropsychiatric disorders increased as the fighting intensified and as the period of continuous combat was prolonged, one concludes that the incidence rates in the two wars were about the same. However, Koontz[4], after reviewing the same statistics, has concluded that neuropsychiatric casualties in World War II were 100 times as great as in World War I.

When we consider specific neuropsychiatric disease entities, we find that epilepsy,

gas neurosis, central nervous system lues, neurocirculatory asthenia, and hysteria were diagnosed at a higher rate in World War I than in World War II. On the other hand, the syndrome of combat fatigue and gastrointestinal neurosis were diagnosed at a higher rate during World War II.

Veterans hospital admissions

Neuropsychiatric disabilities constituted almost 50 per cent of all hospital admissions in veterans hospitals in 1927. Most of these cases were diagnosed as psychoneuroses. Following World War II, the Veterans Administration and neuropsychiatrists in private practice saw a predominance of cases of residual combat exhaustion, characterized by nervousness, startle reaction, dreams of combat, restlessness, disturbances in sexual functions, and an inability to settle down in sedentary civilian occupations.

It is interesting that many men who did not report on sick call with combat exhaustion symptoms while in the Army, became typical examples of combat exhaustion after being separated from the service. It is also interesting that many of the wounded who did not show signs of combat exhaustion while being processed through theater of operations hospitals did become typical examples of combat exhaustion after arriving at hospitals in the zone of the interior, or even after being separated from the service. This would seem to indicate that the symptoms of combat exhaustion could be held in abeyance by the soldiers until they reached their breaking point, or as long as they felt that individual pride, or pride in their unit or the Armed Forces made it expedient for them to do so. All observers report that when soldiers were sent to rest areas, when they were evacuated to the zone of the interior, or when they were separated from the service, they had a tendency to cease covering up their symptoms of combat fatigue.

Conclusion

" . . . . . An old soldier got his name enrolled among the sick, though he ailed nothing, which being discovered, he confessed he was in love with a young woman and wanted to go along with her to the seaside." " . . . He lost his spirits, grew diffident of the protection of the gods, suspicious of his friends; and having given away to fears of supernatural influence his mind grew disturbed and easily alarmed. He drank all the next day upon which he fell into delirium and died. They say Olympia poisoned him. However, many are of the opinion that all this is a mere made up story."

The above quotations are descriptions by Plutarch of a soldier in Alexander's army and of Alexander himself following his great defeat in India at the age of 33 in 323 B.C.[5]

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Abstract of Discussion

Dr. Leslie B. Hohman (Durham): I would like to emphasize one point Dr. Wilkinson made: the importance of morale both in the development and in the incidence of combat fatigue. The incidence was high on ships where the morale was poor, and low where the morale was good.

Combat fatigue is dependent on another factor that Dr. Wilkinson emphasized—the duration and severity of the combat. In prolonged combat, combat fatigue or exhaustion was almost universal. In some cases it rose to a clinical level necessitating the hospitalization or return of the soldier or sailor, while in other cases it did not.

I made a study of the veterans returning to Duke after the war. None was on the sick list, and only one or two had been discharged as neuropsychiatric casualties; but 60 per cent of all the returning students had symptoms of combat fatigue within six months after the end of combat.

The wounded also experienced combat fatigue. In the hospital in which I worked were a large number of patients with combat neuroses (1,200 under treatment at one time), a large proportion of whom had come from the medical and surgical wards. They had been hospitalized originally for wounds or physical symptoms, and transferred to the neuropsychiatric service because of combat fatigue.

Hysteria in the Navy was uncommon—I suspect for the same reason that Dr. Wilkinson pointed out in connection with the Russian troops—most of the men who had it died. A man in a hysterical convulsion aboard ship was not likely to survive.

Dr. J. W. R. Norton (Raleigh): I have been impressed by the changes in terminology and in our understanding of neuropsychiatric problems from one war to another. For instance, the "shell shock" of World War I has been superseded by the "combat exhaustion" of World War II. We now recognize the fact that there is a limit to a person's mental and emotional endurance just as there is to his physical endurance. Consequently, there is less stigma attached to the breakdowns that occur today in both civilian and military life. We change our attitudes and our definitions, but the condition is largely the same.

I would like to refer to a report made by General Hugh Morgan concerning the possibility of predicting—on the basis of physical, neurologic, and psychiatric examinations—a person's ability to stand up under combat. That brings up the point, made by Dr. Hohman, of the importance of unit spirit and morale.

You might be interested in one little incident that

I observed in Sicily. As you know, we fought our way straight through that country, under General Patton, for 37 days, without much letup from beginning to end. About a month later a considerable number of suicides occurred. At one forward dressing station, between sundown and midnight, I saw come in 67 soldiers who were shot through the left foot. The men were breaking down and giving up in one way or another. I think this condition largely explains the much publicized slapping incident.

Another incident that took place in Sicily: In carrying out orders to strike back of enemy lines, a platoon of about 60 of our men were separated from the rest of their unit. The objective had already been taken when communications went awry, and our own forces began firing on the men who had taken the objective. The firing continued for three days. I saw some of those men afterwards—about 15 or 20, as I recall, survived the ordeal—and they were as completely broken, mentally and emotionally, as any group I have ever seen.

MYXEDEMA

A Controllable Condition Which is Frequently Overlooked

GEORGE T. HARRELL, M.D.

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The thyroid gland, the chief regulator of the body's metabolism, determines the rate at which food is burned as fuel for the body. The thyroid hormone, apparently by acting as a catalyst for respiratory enzyme systems, regulates oxygen consumption. It is this function of the gland which has received greatest emphasis and study in the past, and which is the basis for the commonly used clinical test of thyroid efficiency—the basal metabolic rate. Possibly of equal importance is the effect of the thyroid hormone on fluid distribution. Since the thyroid affects the function of all organs of the body, uncorrected alterations in thyroid activity may produce permanent damage.

The clinical picture associated with hyperfunction of the thyroid gland is familiar. Hypofunction produces a clinical picture which is the direct opposite of this. Hypofunction—which must be contrasted with hypometabolism from other causes—may vary in degree from a simple depression of thyroid function manifested by mild symptoms to the extreme case with all the manifestations of myxedema. Thyroid replacement therapy corrects the immediate abnormality, and if given early enough will prevent damage to the organs. It is the most satisfactory type of endocrine therapy, since it can be given orally and can be easily controlled by simple observation. However, if myxedema is allowed to go uncorrected, it may lead to secondary effects which are dangerous to life.

Etiology and Classification

Myxedema is frequently overlooked, probably because the onset is so slow and insidious. The congenital form of severe hypothyroidism—cretinism—is not too difficult to recognize, but unfortunately it is not completely correctable unless diagnosed within the first years of life. Juvenile myxedema is a metabolic defect which often begins near the time of puberty, and may be associated with abnormalities of pituitary function. Many cases of myxedema follow an infection of the thyroid gland. During the acute stage of thyroiditis the gland has a woody feel, and symptoms of thyroid hyperfunction result from the irritation produced by the inflammation. The symptoms of hyperfunction are usually followed by myxedema of increasing severity. Another common cause for hypothyroidism is operative removal of too much of the gland. Postirradiation cases following the therapeutic administration of iodine (I^{131}) are increasing in frequency and represent a new etiologic classification.

Diagnosis

Early recognition of myxedema is important, because some complications, particularly those associated with alterations of fat metabolism, are irreversible. The diagnosis is an easy one to make clinically, and is often suggested by the patient's appearance before the history is obtained. Frequent complaints are constipation and intolerance to cold. The patient may state that he requires more covers than other members of the family. Other endocrine abnormalities, particularly disturbances in menstruation, are often present.

Physical signs

The physical signs, which may be related to any system in the body, are easily recognizable if one is on the alert for the disease. The temperature is usually below normal, and the pulse is frequently slow and of poor volume. The face is puffy, and shows coarsening and thickening of the features as well

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The Na 24 used was supplied by the National Laboratory, Oak Ridge, Tennessee, on allocation from the Atomic Energy Commission.

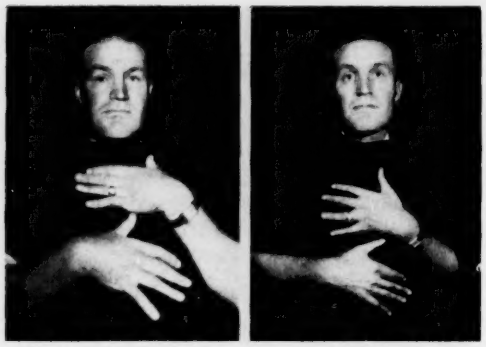

Fig. 1. A 35 year old lumberman with unrecognized myxedema of 3 years' duration.

Left: Photograph taken June 1, 1948, before thyroid therapy.

Right: Photograph taken November 22, 1948, after therapy with 128 mg. of thyroid daily. Note the changes in the face, eyes, hands and hair, accompanied by a loss of ten pounds in weight.

as swelling of the eyes (fig. 1, left). The voice is usually low and has a hoarse, froglike quality. The skin is cool, dry, and often scaly; the secretion of the sweat glands and sebaceous glands is diminished or absent, and the skin lacks normal resiliency and texture.

Since the growth of hair is suppressed, the hair is scanty, not only on the scalp, but on the extremities and in the axillae and pubic areas. The hair is dry, and may be fine or coarse. The eyebrows are thin, particularly at the lateral margins, and do not meet in the center; women rarely have to pluck them. Men find that they do not have to have haircuts as frequently as in the past, often going months rather than weeks. The nails are usually thin and brittle, and their growth is slowed. Patients state that the nails need cutting infrequently, and that they usually splinter or break before reaching a fashionable length.

The response of the mind is slowed, and the reaction time is prolonged. In occasional severe cases, mental abnormalities progressing even to the point of mania may occur, but these are rare. The sense of humor is usually retained, though it may take the patient longer to laugh at a joke.

The slow and diminished peripheral pulsations indicate slowing of the circulation. The heart sounds are distant and usually of poor quality, lacking the snapping muscular sound of the normal heart. The arteries in long standing cases become thickened and markedly arteriosclerotic.

It should be kept in mind that as the disease continues uncorrected, the puffiness and obvious edema may be replaced by a picture of cachexia, with loss rather than gain in weight. Serous effusions may appear in the pleural, peritoneal, or pericardial cavity[1].

A simple diagnostic sign which seems to be specific to myxedema is the delayed relaxation of tendon reflexes[2]. This physical sign is important, since no apparatus is necessary to elicit it, and it may be detected in any tendon with the unaided fingers. The sign has not been found in patients with edema due to other causes, nor in cases of hypometabolism resulting from other endocrine disturbances. It apparently reflects the altered distribution of fluids in the body, and is quickly reversible with treatment. In fact, it is often the first physical sign to revert, and may disappear within one day after the beginning of adequate replacement therapy. Once the sign has been felt, it is instantly recognizable.

Hormone replacement therapy is quickly followed by a reversal of the abnormal physical signs (fig. 1, right), except in long-standing cases where permanent damage has occurred.

Laboratory findings

The laboratory findings can be easily correlated with the physical signs. The oxygen consumption is usually reduced, so that the basal metabolic rate is lowered. In cases of complete myxedema, the reading is usually in the range of minus 38 to 40 per cent of normal. Lower rates may be encountered in patients with anorexia nervosa or pituitary cachexia. It should be remembered that the presence of congestive failure tends to elevate the basal metabolic rate; hence the reading obtained in patients with myxedema heart disease will be higher than anticipated.

The blood cholesterol is usually above 250 mg. per 100 cc. This elevation reflects the altered lipid metabolism, and probably is a major factor contributing to the early development of severe arteriosclerosis.

Anemia is frequent, and the hemoglobin is usually in the range of 10 Gm. Early in the course of the disease, the anemia is hypochromic in type; later it may become hyperchromic and macrocytic. The slightly yellow color of the skin, as well as the presence of papillary atrophy in the tongue, may cause the condition to be confused with pernicious anemia. In myxedema, however, the sternal

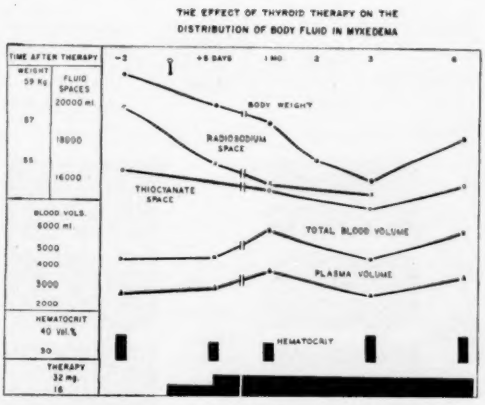

Fig. 2. Effect of thyroid therapy on the distribution of body fluids in a 49 year old housewife with unrecognized myxedema of 7 years' duration.

bone marrow will be found hypoplastic, rather than hypercellular with arrest in the maturation of erythrocytes, as is the case in pernicious anemia[3].

Gastric analysis shows the hydrochloric acid to be reduced or absent, and gastroscopic examination reveals atrophy of the mucosa[4]. Doubtless the alteration in gastric function contributes to the frequent symptoms of indigestion as well as anemia. Edema and hypomotility of the gastrointestinal tract interfere with absorption, increase the anorexia, and hence contribute to cachexia and avitaminosis. The glucose tolerance test usually shows a low or flat curve, reflecting the defect in absorption. It has not been determined how much the poor absorption of glucose contributes to the alteration in lipid metabolism.

The circulation time is slowed, and values in the range of 19 seconds are often obtained when the arm-to-tongue test utilizing a solution of calcium gluconate is employed. The increase in capillary permeability may be detected in the skin by the presence of dermal fluorescence after the injection of fluorescent dye into the blood stream; it may also be detected by an increase in the amount of protein which has filtered through the choroid plexus into the spinal fluid[5]. Alterations in the distribution of fluid are shown also by the increase in body weight and in the space available for dilution of thiocyanate and radioactive sodium (Na^{24}) ions (fig. 2). When thyroid replacement therapy is given, fluid and sodium ions are quickly mobilized and excreted in the urine. The thiocyanate

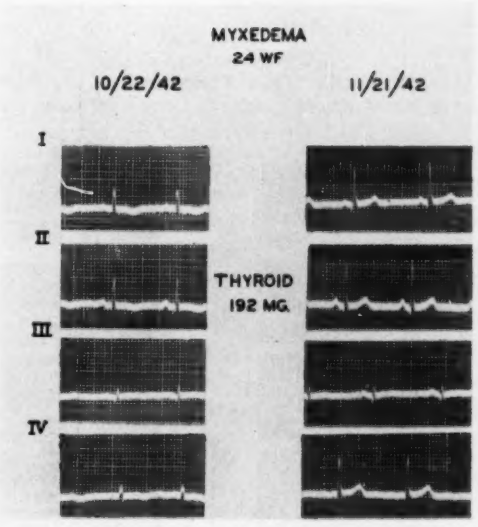

Fig. 3. Electrocardiographic changes in a 24 year old housewife with myxedema.

Left: Before thyroid therapy.

Right: After 1 month of therapy with 192 mg. of thyroid daily. Note the increase in amplitude of the PQRS complexes and the reversal of the T waves in leads 1, 2 and 4.

space may be reduced to half its baseline value in thirty hours, and loss of 3 Kg. of weight in the space of two days is not uncommon. The hematocrit is temporarily decreased and the blood volume increased as fluid is transferred from the tissues into the blood stream, but these changes revert to normal as diuresis occurs.

The fact that the total serum proteins and the albumin-globulin ratio are usually normal helps to distinguish myxedema from advanced nephritis, with which it may be readily confused. This confusion results from the presence of edema pallor and from the depression of renal function which usually occurs in myxedema. The slight albuminuria and the high blood cholesterol are other findings suggestive of the nephrotic syndrome.

Alterations in cerebral utilization of oxygen and glucose have been reported[6]. These alterations, which are reflected in the electroencephalogram, probably account for the mental changes associated with the disease. The alterations in the circulation are reflected in the electrocardiogram by a decrease in the amplitude of the waves. This change is quickly reversible by treatment, however (fig. 3). If myxedema has been present for several years, changes compatible with coronary

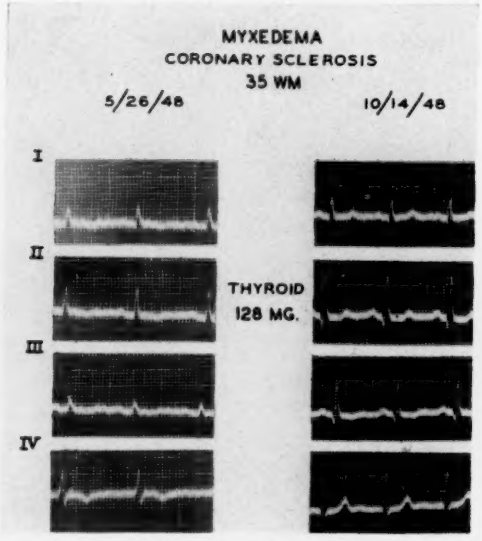

Fig. 4. Electrocardiographic changes in the 35 year old lumberman whose photographs are shown in fig. 1.

Left: Before thyroid therapy.

Right: After 5 months of therapy with 128 mg. of thyroid daily. Note the development of deep Q waves in leads 2 and 3, with smaller ones in leads 1 and 4; an S wave has appeared in lead 4. Though the T wave in lead 1 is higher and in leads 2 and 4 now upright, the T wave in lead 3 is diphasic. The Q wave changes, suggestive of reduced coronary blood flow to the posterior portion of the left ventricle, were associated with angina on effort. A change in thyroid dosage to 64 mg. daily was accompanied by a reduction in the extent of the angina and of the electrocardiographic alterations.

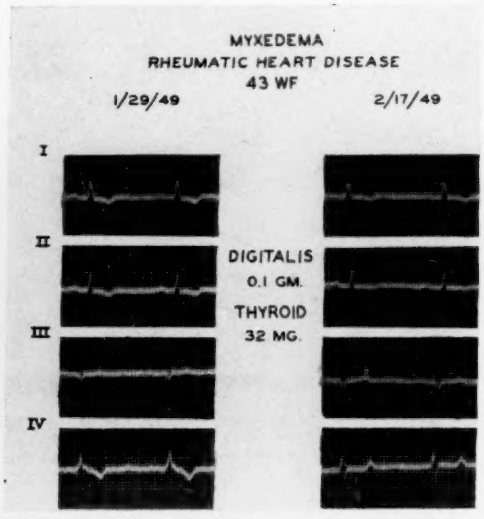

Fig. 5. Electrocardiographic changes in a 43 year old housewife with myxedema untreated for 1 year. The patient had rheumatic heart disease of 19 years' duration. A complete thyroidectomy was performed 10 years before admission and the patient had been on thyroid therapy for the next 9 years.

Left: Before thyroid therapy after complete digitalization was ineffective in controlling congestive failure.

Right: After 1 month of therapy with 32 mg. of thyroid daily which induced a diuresis. Later symptoms of angina on effort developed when the dose of thyroid was increased by 32 mg. three times weekly, suggesting the presence of a third type of heart disease—coronary sclerosis. At that time in lead 4 the R wave was higher and the T wave was upright.

sclerosis may appear after treatment with thyroid extract (fig. 4).

The electrocardiogram may be very difficult to interpret when underlying heart disease is present in patients with myxedema. Figure 5 shows the electrocardiogram of a patient with chronic rheumatic heart disease in whom unrecognized myxedema developed following a complete thyroidectomy for a nodular goiter. She was admitted to the North Carolina Baptist Hospital with intractable congestive failure which did not respond to the administration of digitalis or restriction of salt. The presence of myxedema heart disease was recognized, and treatment with thyroid was started. This corrected the myxedema heart disease, but brought out symptoms of angina. Thus it was found that this patient was suffering from three different types of heart disease—rheumatic, myxedematous, and coronary. Careful regulation of therapy has enabled her to return to light housework after having been completely bedridden.

Treatment

Administration of thyroid

Specific therapy consists solely in replacement of the thyroid hormone. It is not necessary to administer any other type of endocrine therapy simultaneously. Different preparations of thyroid extract vary in potency because of differences in manufacturers' methods. Since the use of a single preparation will make it easier to become familiar with the response to be expected from given doses, the physician should select one reputable product and have his druggist always use that brand. The patient should be taught to buy the same product whenever he replenishes his supply.

Nausea is so infrequent that the enteric-coated preparations need not be used. The extremely powerful purified hormone, thyroxin, is likewise unnecessary, since the response

to desiccated thyroid, though slower, is perfectly satisfactory. Because of the slow action of the drug, a single dose daily is all that is required.

Since the disease usually comes on slowly, there is rarely any necessity for speed in correcting the process. It is therefore safest to start with small doses of thyroid extract in order to avoid complications. Especially in older patients and in unrecognized cases of long standing, regardless of age, the initial dose should be small—in the range of 16 mg. (¼ grain) daily. Even though the patient may be young, long continued myxedema may cause his biologic age to be considerably greater than his chronologic age. The need for caution is greatest in long-standing myxedema of the pituitary type, since the administration of large doses of thyroid to such patients may precipitate an adrenal crisis. In young individuals who are known to have had the disease a short time, it is safe to start with a daily dose of 32 to 64 mg.

Since the effect of the drug is cumulative over a period of two to four weeks, doses should not be changed frequently but should be increased gradually at monthly intervals. The maximum dose that should be required even for severe myxedema is 196 mg. (3 grains), and most patients will note great subjective improvement on smaller doses.

Patients should be impressed with the fact that they must continue to take the drug indefinitely, exactly as insulin must be continued in diabetes. Administration of the drug is replacement rather than curative therapy. Slightly smaller amounts may be required during the summer months, however.

It is not necessary to bring the basal metabolic rate entirely to normal. Tremendous improvement will be noted in most cases, even though the basal metabolic rate may remain between minus 10 and minus 20. If possible, however, it is desirable to restore the blood cholesterol to normal levels.

Supportive therapy

Supportive therapy in the form of supplementary vitamins may cause the signs of vitamin deficiency, particularly peripheral neuritis, papillary atrophy, cheilosis or even frank pellagra, to clear up more quickly than will diet alone. The anemia will usually respond to diet and thyroid, but a return to normal values may be speeded up by the administration of iron. The use of liver, folic acid, or vitamin B_{12} is rarely necessary, even in the hyperchromic, macrocytic types of anemia. Indeed, failure of such anemias to respond to hematopoietic agents is often a diagnostic aid leading to the recognition of myxedema.

The use of other drugs

When any drug except thyroid is administered to patients with myxedema, it should be started in extremely small doses and given very cautiously. These patients are extremely sensitive to certain drugs, including quinine and morphine. We have observed exaggerated responses to autonomic blocking agents such as Priscoline in doses one-third to one-fourth of those tolerated by normal individuals. Because of the tendency of bromine to replace iodine in chemical molecules, bromides should not be used for sedation in patients with myxedema. The similar ability of the thiocyanate ion to replace halides would contraindicate the use of thiocyanate in myxedematous patients who have hypertension. Since the sulfonamides are known to block enzymatic steps in the synthesis of thyroid hormones, it would be advisable to use antibiotics rather than sulfonamide drugs when an infection occurs.

The appearance of angina during treatment with thyroid reflects the increased demands of the myocardium for oxygen and the inability of the coronary artery to supply the necessary amount of blood. Though our experience is limited, we have gained the impression that in patients whose exercise tolerance is reduced after the administration of thyroid, the administration of lipotropic substances such as choline or methionine over a period of six to twelve months as an adjunct to thyroid therapy may produce clinical improvement, even though the electrocardiogram is relatively unchanged. Such therapy has not caused marked alteration in the total lipid and phospholipid fractions of the blood, however, even though the blood cholesterol may be reduced.

Conclusion

It is unfortunate that myxedema, an easily diagnosable and controllable condition, is so frequently overlooked until irreversible damage has been done. If the disease is recognized early and treatment is carefully carried out, patients with myxedema are among the most satisfying that a physician can have. Thyroid replacement therapy is effective in

restoring the patient to a happy and useful life.

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Discussion

Dr. Ernest Yount (Winston-Salem): There are few more appropriate titles than the one Dr. Harrell has chosen—"Myxedema: a Frequently Overlooked Controllable Condition." In a series of 50 patients reported not too long ago, the duration of symptoms prior to the establishment of a diagnosis of myxedema was two to six years. Along with Dr. Harrell, I would like to emphasize the diagnostic value of delayed tendon response to normal, which he has demonstrated as being pathognomic of myxedema.

At the present time there is no value in using anything other than thyroid extract in treating patients with myxedema. With the increasing availability and improved methods of standardization of thyroxin, however, it is to be hoped that in the future this synthetic product will provide a more constant type of therapy than does the extract.

It has always irritated me to see the premature articles in newspapers and lay magazines on medical subjects. Patients come in the office daily wanting to know why this or that new treatment has not been used in their case. They have read the articles in the lay periodicals, many of them reports of experimental work still in an immature state. The physician has to use his precious time explaining that the treatment has not been sufficiently evaluated to be used by him. Nevertheless, he is often forced to use it when his better judgment tells him to hold off. I can well remember when the use of vitamin E for coronary artery disease was announced by the lay press. Many of my own patients insisted on taking the vitamin. I had to explain to each that I could promise nothing, but, since it appeared that the use of vitamin E was harmless, I reluctantly gave the prescription. It is we, the physicians, who are responsible for giving our patients their medical education, and therefore each of us must learn to explain medical matters in the simplest terms and take the time to do it.—Yater, W. M.: Keeping Abreast of Medical Progress, Pennsylvania Medical Journal 54:425 (May) 1951.

The ascendency which the anterior pituitary has gained over the endocrine system may be likened to that of the cerebral cortex over the nervous system. As the cerebral cortex signals various parts of the soma over pathways of varying numbers of neurones, so does the pituitary at times send a hormone to impinge directly on an effector target . . . —Means, J. H.: The Integrative Action of the Endocrine System, Ann. Int. Med. 34:1314 (June) 1951.

CORTISONE AND AUREOMYCIN IN THE TREATMENT OF A CASE OF ROCKY MOUNTAIN SPOTTED FEVER

WILLIAM C. ARNEY, M.D.

MORGANTON

Rocky Mountain spotted fever is an acute febrile illness caused by Rickettsia. In its etiology and clinical course it may be difficult to distinguish from typhus fever. The disease is endemic in the western states of the Rocky Mountain area, where it is transmitted to man by the tick *Dermacentor andersoni*, and in the east and south where it is transmitted to man principally by the dog tick *Dermacentor variabilis* [1].

Pathology

The basic pathology is characteristically a diffuse endangiitis. The distinctive gross lesions result from thrombosis of small blood vessels[2]. Necrosis and hemorrhage of the skin, the scrotum, the lobes of the ears, and the fingertips may occur.

The rash appears from the third to the fifth day of illness. It is rose-colored, macular (the macules measuring from 1 to 5 millimeters in diameter), may become confluent in areas, and after a few days may become petechial as the result of thrombosis and hemorrhage from small blood vessels. When rose-colored, it blanches on pressure. It appears first on the wrists, ankles, and back. In milder cases, a prodromal period marked by malaise and chilly sensations may occur. The onset is usually accompanied by a chill, with elevation of temperature to 102 to 103 F., headache, and pain in the bones and muscles. Considerable restlessness with insomnia is a distressing symptom complex, and vomiting is not unusual. The fever runs from 102 to 103 F. during the first seven days, and during the second week, from 103 to 106, or even 107. After the second week the fever comes down by lysis. In fatal cases the fever goes to 106 or 107 F., the pulse rises, and coma ensues, followed by death.

The pulse rate runs from 110 to 130. The white cell count seldom exceeds 12,000. The red cell count drops to about 3,500,000; eosinophils diminish or disappear; there is an increase in monocytes. The agglutination with proteus OX^{19} shows a rising titer.

Unusual response to cortisone and aureomycin therapy in an apparently moribund

patient is seen in the following case report.

Case Report

The patient, a 57 year old white widow, the mother of six children, was first seen at home on May, 17, 1951. The chief complaint was headache, fever and distressing pains in her back and legs. The illness had begun on May 12, 1951, with malaise and chilly sensations, headache, anorexia, and restlessness. These symptoms had increased up to the time when she was first seen.

The family history was not contributory. The past history disclosed the usual childhood diseases.The patient had had no serious illnesses until May 5, 1947. When I saw her on this date, she had heart failure, and had been ill for two weeks. She was digitalized, and the symptoms were relieved. After four months the digitalis was discontinued, and she has had no return of symptoms. I have seen her at intervals of one to six months since then. There was no history of tick bite, although she lives in the country, and no history of immunization or vaccination.

Physical examination disclosed an acutely ill white female, appearing five years older than her stated age of 57. She was slender, poorly developed, poorly nourished, and had rather dark skin. She was restless and complained of fever, headache, and back and leg pain. The pulse was 74, and the blood pressure was 140 systolic, 80 diastolic. Significant findings were as follows: The nasal septum deviated to the left. The tongue was coated, with red edges. The apex of the heart was 4 cm. to the left of the midclavicular line. The spleen was palpable. A faint, rose-colored macular rash, which blanched on pressure, was scattered over the body, arms, and legs.

A tentative diagnosis of Rocky Mountain Spotted Fever was made, and the patient was strongly urged to enter the hospital, When this proposal was refused, she was put on Chloromycetin, 250 mg. every four hours. The patient discontinued the medication after 48 hours, because of nausea which she attributed to the drug.

The symptoms previously described became progressively worse, with the addition of diarrhea on May 20, 1951. Little fluid was taken, and no food. Restlessness was acute, and delirium ensued May 21.

She was finally brought to the hospital by ambulance at 12:30 the following morning—restless, mentally confused, and very drowsy. The physical examination at this time showed only the following changes: the pulse was 80, blood pressure 145 systolic and 90 diastolic, respiration 28, and mouth and skin were dry. There was a suggestion of stiffness of the neck on flexion of the head. The rash was unchanged.

Laboratory data: Blood studies showed a hemoglobin of 13.8 Gm., a red cell count of 4,700,000, and a white cell count of 10,000, with 96 per cent polymorphonuclears and 4 per cent lymphocytes. The urine was acid, clear, and amber, with a specific gravity of 1.015. Tests for albumin, sugar, and acetone were negative. There were a few epithelial cells, and white blood cells were rare. Cultures of the blood and urine were reported negative for growths. Studies of the spinal fluid showed 4 white cells, including 1 polymorphonuclear and 3 lymphocytes. The Kline test was negative. Agglutination tests were negative, with the exception of proteus OX^{19}. Blood drawn for this test on May 22, 1951 was positive in a titer of 1:80. On May 24 the titer was 1:160, on May 29 it was 1:160, and on September 11, 1:40. The complement fixation test for Rocky Mountain spotted fever done on September 11 was positive in a titer of 1:160.

Hospital course: The patient was given Chloromycetin, 250 mg. every four hours, and the following intravenous fluids during her hospital stay: 5,500 cc. of 5 per cent glucose, 3,000 cc. of protein hydrolysate, 1,500 cc. of 5 per cent glucose in normal saline, and 500 cc. of 10 per cent glucose.

Her course was steadily downhill. By 9 a.m. on May 23 she was comatose. Her temperature rose to 106 F., her pulse was 140, respiration 50, blood pressure 100 systolic, 80 diastolic. The clinical picture was one of impending death. By this time it was no longer possible to give anything by mouth. It was decided to give 500 mg. of aureomycin in 500 cc. of 5 per cent glucose intravenously, and 100 mg. of cortisone intramuscularly every six hours for three doses[3]. Within six hours her clinical picture was improving. Twelve hours later the intravenous administration of 500 cc. of aureomycin was repeated. It was repeated twice within the next 24 hours, then once daily for three days.

The patient's improvement was continuous. Eighteen hours after starting cortisone and aureomycin she was again able to take fluids by mouth. The temperature returned

to normal after 24 hours. Her convalescence from then on was uneventful. At the present time she shows no unfavorable results of her illness.

Comment

This case was considered to be a severe case of Rocky Mountain Spotted Fever. The patient had not received an adequate dose of Chloromycetin[4]. It was felt that unless an adequate dose of medication was given quickly, she would expire. Aureomycin was used, because a therapeutic blood level could be attained rapidly and could be maintained by the intravenous route in an almost moribund patient. Cortisone was decided upon, because theoretically it should decrease toxicity[5]. It is considered to have made a large contribution to the reduction of fever, and to have improved the clinical condition temporarily. Cortisone is not considered specific treatment for Rocky Mountain spotted fever. In this case, however, in view of the very rapid improvement in the clinical picture it would appear to have been life-saving to a moribund patient. Aureomycin would not be expected to change the clinical picture within a period of six hours.

A review of the literature shows that aureomycin, terramycin and Chloromycetin have proved about equally effective in the treatment of Rocky Mountain spotted fever, and are all superior to para-aminobenzoic acid. No case was found in which cortisone was used in rickettsial infection.

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Nursing needs have increased in spite of lower death rates, longer life expectancies, and a generally healthier population. The number of people in the United States has increased by an estimated 16,000,000 since the 1940 census. More people are now living to an older age than ever before, and consequently the diseases and disabilities of older people have multiplied. A high standard of living has prevailed since the early years of the war, medical prepayment plans have spread, and public health services have been expanded in many areas. In 1940, 10,087,000 patients were admitted to hospitals in the United States, but by 1948 the number of hospital admissions had risen to 16,422,000. Pub. Health Reports, August 5, 1949, Chesley Bush, M.D., Esta H. McNett, R.N., B.S., Lucile Petry, M.A., and Martha B. Naylor, R.N., B.S.

BODY POTASSIUM LOSS DURING THERAPY WITH ACTH AND CORTISONE

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and
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ACTH is a hormone produced by the pituitary gland. Its administration stimulates the adrenal cortex to produce hormones which affect diverse physiologic functions. Cortisone appears to be but one of the hormones produced by the adrenal cortex. Its systemic effects are similar to those produced by ACTH.

When cortisone is administered therapeutically, this steroid acts as a substitute for the natural hormone. Both ACTH and cortisone alter electrolyte metabolism, causing retention of sodium and excessive urinary excretion of potassium. For this reason, a low sodium diet and the administration of supplementary potassium have been employed as adjuvants to therapy with either of these drugs[1].

Quantitative data on this effect are based on external studies of the electrolyte balance, which are indirect measures. Such studies have indicated that the loss of potassium during therapy with ACTH and cortisone exceeds the amount of nitrogen which would be lost as a result of the destruction of tissue cells[1a] Hence the potassium loss cannot be explained solely on this basis, and it appears, therefore, that an absolute deficit of this cation is induced. The systemic effects of potassium depletion, such as muscular weakness, respiratory difficulties, and electrocardigraphic changes, are well known[2].

The availability of the radioactive isotope of potassium, K^{42}, has made possible direct measurements of the exchangeable potassium content of the body[3]. For this purpose, a tracer dose of K^{42} is injected intravenously. After sufficient time has elapsed for the tagged atoms to achieve equilibrium with the native atoms in the body, the specific activity

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K^{42} was supplied by the Oak Ridge National Laboratory, Oak Ridge, Tennessee, on allocation from the U. S. Atomic Energy Commission.

*Research fellow of the American Heart Association sponsored by the 20-30 International Rheumatic Fever Foundation.

of the urine specimens is used to calculate the exchangeable potassium content of the body[3]. By such a method, it has been found that the mean exchangeable potassium content (Ke) in 30 healthy young adult males is 46.3 milli-equivalents per kilogram, with a range of 35.6 to 57.1 milli-equivalents per kilogram[3]. In 20 normal young females, the mean value is 31.5 milli-equivalents per kilogram, with a range of 25.1 to 35.9 milli-equivalents per kilogram[4].

The purpose of this report is to point out the magnitude of the depletion in body potassium which can be caused by the administration of ACTH or cortisone. Four cases studied serially by the radioisotope technique are cited.

Case Reports

Case 1

A 65 year old woman was hospitalized for treatment of mild rheumatoid arthritis of four years' duration. During the seven day period of study, she received ACTH intravenously, 20 mg. daily, and potassium chloride orally, 3 Gm. daily. Exchangeable potassium (Ke) determinations were done on the first and last days of the study. The results were as follows:

Day of Study	Weight (Kg.)	Ke (m-eq.)	Ke/Wt. (m-eq./Kg.)
1	51.1	1777	34.8
7	49.0	1266	25.8

Comments: This case reveals a striking decrease in the total body potassium (29 per cent of the initial value), despite supplementary doses of this mineral. No signs or symptoms of potassium depletion were noted.

Case 2

Seven months prior to hospitalization, this 25 year old man had a sore throat, followed in two weeks by fever and polyarthritis. He was given cortisone, which he continued to take in varying dosages, depending upon the severity of his symptoms. Dietary sodium was not restricted, and no supplementary potassium was prescribed. Within six months the body weight increased 45 pounds. Three weeks prior to hospitalization, he noted band pigmentation of the nails.

Physical examination on admission revealed acne, "moon" facies, a "buffalo hump," and the fat distribution typical of Cushing's syndrome. The temperature was 101 F. Marked improvement in the arthritic symptoms was observed when the patient was given salicylates. Hormone therapy was stopped. No supplemental potassium was administered, but the patient was placed on a liberal diet which contained approximately 3 Gm. of potassium per day. He was hospitalized for 15 days. Two months after discharge, he was symptom-free, and the signs of cortisone intoxication had disappeared.

Day of Study	Weight (Kg.)	Ke (m-eq.)	Ke/Wt. (m-eq./Kg.)
1 (Second hospital day)	87.7	2340	26.7
6	85.4	2256	27.6
14	85.0	2966	34.9

Case 3

A 33 year old man began to have chills, fever, polyarthritis, cardiomegaly, and anemia in February, 1951, three weeks after a streptococcal pharyngitis. While hospitalized elsewhere, he received both ACTH and cortisone. In the early part of March, 1951, he was given oral cortisone, 100 mg. daily, which he continued without sodium restriction or potassium replacement until he was admitted to the North Carolina Baptist Hospital late in August.

Physical examination revealed acne, "moon" facies, and a cervical fat pad. The blood pressure was 150 over 94. Both knee joints showed effusion. The arthritic symptoms responded promptly to salicylates and aminopyrine. Hormone therapy was discontinued, and he was given a liberal diet. No added potassium was prescribed.

Day of Study	Weight (Kg.)	Ke (m-eq.)	Ke/Wt. (m-eq./Kg.)
1 (Second hospital day)	69.6	2099	30.2
7	70.2	2302	32.8

Comment: In these two patients, marked potassium depletion was present following unregulated cortisone therapy. In neither case had it progressed to the point where clinical signs of potassium deficiency were recognizable. Following withdrawal of hormone therapy, the body promptly began to make up the deficiency from the diet.

Case 4

A male painter, aged 56, was first admitted to the North Carolina Baptist Hospital in 1948 because of exfoliative dermatitis of undetermined etiology. At that time local and supportive therapy produced a remission. He was admitted for the second time in July, 1950, in a moribund state following a recurrence. Treatment with ACTH, 40 mg. daily, produced marked improvement. Whenever the drug was temporarily withheld, evidences of recurrence appeared, and it was necessary to maintain him on ACTH during the next five months. Additional treatment included potassium chloride, 1 Gm. daily, and moderate sodium restriction. When he was discharged in December, 1950, his dermatitis was adequately controlled by cortisone, 50 mg. daily. He was told to continue his potassium supplement, and was given directions for a low sodium diet (less than 2 Gm. daily). He was seen monthly in the outpatient department, and aside from "moon" facies showed no visible sign of cortisone intoxication; no dermatologic symptoms or signs developed.

After eight months on cortisone, he was readmitted for a course of ACTH in preparation for the withdrawal of hormone therapy. During the period of study, he received ACTH intravenously on the following schedule: Day 1, 20 mg.; days 2-8, 40 mg.; days 9-14, 20 mg. During days 1-5, he also received oral cortisone, 50 mg. daily.

Ke studies were as follows:

Day of Study	Weight (Kg.)	Ke (m-eq.)	Ke/Wt. (m-eq./Kg.)
1	77.3	3127	40.5
7	79.1	3439	43.5
14	77.3	2856	36.9

Comment: In this instance, it appeared that moderate dietary sodium restriction and the administration of supplementary potas-

sium over a long period of time provided adequate substitution therapy. The increase noted in the second Ke level, followed by a decrease on the third determination, suggests suppression of adrenal cortical activity due to the administration of cortisone. This effect became evident when cortisone was withdrawn and was counteracted when the full effect of ACTH on the gland was realized.

Discussion

Although data pertaining to electrolyte metabolism during long-term therapy with ACTH or cortisone are limited, external balance studies have shown that the urinary excretion of potassium is increased. The magnitude of the depletion of body potassium in case 1, as measured by the K^{42} method, was greater than had been anticipated from previous external balance studies. A deficit of 511 milli-equivalents (29 per cent of the initial value) developed in six days, despite the administraton of a total of 200 milli-equivalents of supplementary potassium. These figures illustrate the potential magnitude of the deficit which may be induced even when a patient is receiving what is assumed to be adequate replacement of potassium. Case 4 illustrates that an individual may be maintained in potassium balance during long-term therapy with ACTH or cortisone if the intake of sodium is adequately restricted (to less than 2 Gm. daily) and potassium supplements are given.

Similar studies in other subjects with potassium depletion indicate that a deficit of slightly more than 29 per cent of the normal body content may result in the sudden development of clinical symptoms and signs of potassium deficiency. The loss of body potassium of the magnitude demonstrated in these 4 cases, although not productive of symptoms, may potentially be very harmful. Alarming symptoms and signs may appear if the depletion is permitted to progress untreated.

Summary and Conclusions

Serial determinations of the exchangeable potassium content, as measured with a radioactive isotope, were performed in 4 patients during and after therapy with ACTH and cortisone. The data reveal a striking depletion in the body's store of potassium, even during replacement therapy with as much as 3 Gm. of potassium chloride daily. The results emphasize the importance of replacing this loss and of recognizing this potential hazard.

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THE USE OF ORAL VASOCONSTRICTORS IN RHINOLOGY

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A congested nose, a running nose, or a combination of these constitutes an important segment of the average office practice of the otorhinologist. The successful management of these symptoms is of extreme importance medically and economically. Therefore, it is the purpose of this paper to examine some of the means by which the symptoms of nasal congestion and rhinorrhea can be successfully controlled. It seems most profitable to inquire first into the physiologic background of these symptoms, and then to discuss drugs which, when administered by the oral route, will control these symptoms.

Basic Principles

Since the challenging work of Proetz[1] in 1941 on the effect of drugs on the nasal mucosa and the ciliary activity, a great deal of information has been obtained concerning the normal physiology of the nose, and the reaction therein in disease and under the influence of various drugs. In my opinion, the bulk of accumulated evidence points to the following fundamental principles for the management of rhinorrhea and nasal congestion:

A nose returns to a normal physiologic state more rapidly, regardless of the path-

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From the Nalle Clinic, Charlotte, North Carolina.

ologic cause for the abnormality, if the nasal mucosa is not abused by the local application of drugs, regardless of their *p*H or the chemical components. It is also my opinion that ventilation of the nasal passages is the foundation on which all nasal health is built. I believe that the normal mucus sheet covering the nasal mucosa is of utmost importance in cleansing the nose as well as protecting the mucosa from contact with noxious agents including bacteria, and that, therefore, any chemical added locally to this mucus sheet is so restricted in the length of time which it acts and in the depth to which it penetrates, that such therapy is probably not justified.

The Physiologic Basis of Nasal Congestion and Rhinorrhea

With this statement of fundamental concepts, let us now turn to the facts concerning the production of nasal congestion and rhinorrhea. Some of these facts are rather new; they are all important, and therefore justify re-emphasis.

Innervation of the nasal mucosa

A significant set of experiments on the autonomic innervation of the nasal mucosa was recently reported by Millonig, Harris, and Gardner[2]. It is worth recalling that the nasal mucosa is innervated by both parasympathetic and sympathetic nerve fibers. The parasympathetic nerve fibers leave the brain stem with the facial nerve and pass through the geniculate ganglia and thence to form the greater superficial petrosal nerve, which passes to the sphenopalatine ganglia. From there, postganglionic fibers travel with the deep branch of the maxillary division of the trigeminal nerve to the nasal mucosa. Harris and his group had an opportunity to study 6 patients in whom the greater superficial petrosal nerve had been sectioned. They found that after this operation the nasal mucosa on the side of the nose that had been denervated showed a lack of normal discharge and much less swelling as compared to that of the other side. The neurohormonal substance which is responsible for the activity of the parasympathetic nerve fibers, at both the preganglionic and postganglionic connections, is probably acetylcholine.

Balancing this parasympathetic innervation of the nose is the sympathetic innervation, which arises in the upper thoracic segments. From here, preganglionic fibers pass by way of the stellate ganglia to the superior cervical ganglion, where they become postganglionic, then to the carotid plexus and into the sphenopalatine ganglia, and thence to the nasal mucosa in the maxillary division of the trigeminal nerve. It is noteworthy that in the sphenopalatine ganglion area both parasympathetic and sympathetic fibers exist side by side. The neurohormonal mechanism of the sympathetic nervous system is carried on by a substance known as sympathin, the activities of which are extremely similar to that of adrenalin.

Parasympathetic imbalance

In conditions of normal nasal physiology, the parasympathetic and the sympathetic systems operate in a state of balance or homeostasis. Any pathologic condition which tends to reduce or increase the activity of one of these systems without similarly affecting the activity of the other results in an imbalance between the parasympathetic and sympathetic neurohormonal outflow, and thence begin changes which produce symptoms[3].

The overactivity of the parasympathetic system caused by the production of acetylcholine has the effect of stimulating the glands of the mucous membrane of the nose, at the same time increasing the turgor of the turbinates. If the parasympathetic outflow is uninhibited or increased by pathologic conditions, a congested and running nose results. If the parasympathetic innervation is decreased or the sympathetic innervation stimulated, the reverse effect takes place. There is vasoconstriction, with inactivity of the mucous glands of the nasal mucosa, and the nose is wide open and dry. This is the typical reaction which is produced by fear and which can also be seen after an injection of adrenalin in the human.

In the simplest terms, the congested and running nose is the result of relative overactivity of the parasympathetic nervous system, with the production of acetylcholine, regardless of the etiologic factor. In certain situations this apparent overproduction of acetylcholine may be the result of decreased effect from the sympathetic nervous system and the absence of a normal amount of sympathin in the physiologic system.

While both acetylcholine and sympathin are destroyed in the body by the enzymolytic systems, too little is known about these

systems at the present time to permit their practical use in therapeutics.

The role of histamine

At the moment there is a great deal of controversy as to just what role histamine plays in this picture. Histamine certainly is present in the body, it may be increased on exercise, and it also may be a factor in producing symptoms similar to those of parasympathetic overactivity in allergic states and possibly in certain other situations in which normal homeostasis has been disturbed[3]. There is suggestive evidence that histamine may produce its effects in the human body by suppressing the activity of cholinesterase and thereby causing a situation of relative parasympathetic overactivity. Certainly, the clinical picture of a histamine-induced reaction is similar to other reactions produced by stimulation of the parasympathetic system, and this factor must be borne in mind when considering therapeutic drugs[4].

Therapeutic Drugs

Atropine and similar compounds

Since Galenic days, atropine-like alkaloid preparations have been known to be useful in combating the clinical effects of parasympathetic overactivity. Since the discovery of atropine itself in 1831, it has been used to control the symptoms of parasympathetic overactivity. It is known now that this drug and its allied compounds act by preventing the formation of acetylcholine at the nerve endings in both the pre- and postganglionic fibers of the parasympathetic nervous system. The main objection to the use of atropine for controlling rhinorrhea and nasal congestion has been that its untoward reactions throughout the body make the patient more uncomfortable. Now, atropine is infrequently employed as an oral preparation to control nasal congestion and rhinorrhea.

In the last few months several new compounds with atropine-like effects on the production of acetylcholine have become available. The most popular of these is Banthine, but there are other drugs prepared which have a similar reaction[5].

These drugs have in common the following effects: They have a profound effect on the smooth muscle of the gastrointestinal tract, at the same time producing rather striking reactions in the nasal mucosa. They do not produce severe mydriasis, which is one of the chief objections to atropine. They are longer acting, requiring less frequent doses. They do, however, generally produce drying of the mouth to an uncomfortable degree. We have found Banthine and another drug known as No. 09031, prepared by the Lilly Company*, to be particularly useful in resistant cases of vasomotor rhinitis (table 1). It is our belief that these cases represent chiefly a psychosomatic problem; but it is often helpful to control the nasal symptoms for a period and then to withdraw the drug, at which time the patient may be completely and permanently relieved of his symptoms. Table 1 demonstrates the results of the use of these two drugs. It is to be pointed out that the dose of either has to be varied for individual patients. This is best done by watching for extreme drying of the mouth as well as for excessive drying of the nasal mucosa.

Table 1
Results of Anticholinergic Drugs in the Control of Nasal Congestion

Drug	*Good*	*Poor*	*Untoward Reactions*
Banthine (50 mg. every 6 hours)	18	3	1 severe mydriasis 2 very dry mouth
No. 09031 (Lilly) (1 mg. every 4 hours)	10	4	none

Antihistaminics

A second useful group of drugs are those which at present are called antihistaminics. I think that this is an unfortunate choice of nomenclature, inasmuch as the activity of these drugs is only apparently antihistaminic, while the name implies that they work only in cases where histamine is present. This is far from true, and there is accumulating evidence to show that the activity of these drugs—which I prefer to call oral vasoconstrictors—may be less closely related to histamine than at first was thought. It is admitted that they prevent certain severe and often fatal histamine reactions in experimental animals. However, the activity of histamine in man is far different from that in animals, and there is evidence that these drugs, especially the ethylenediamines and the thenyl ring compounds, may function by increasing the enzymolytic actions of both cholinesterase and histaminase. If this be true, then these drugs could be expected to produce vasoconstriction and decrease nasal turgor and rhinorrhea, whether

*Drug No. 09031 made available through the courtesy of the Medical Department of the Eli Lilly Company, Indianapolis, Indiana.

Table 2
Types of Drugs

GROUP I ETHYLENEDIAMINE DERIVATIVES		GROUP III MISCELLANEOUS COMPOUNDS	
Pyribenzamine	(Ciba)	Trimeton	(Schering)
Neo-Antergan	(Merck)	Pyrrolazote	(Upjohn)
Neohetramine	(Wyeth)	Thephorin	(Roche)
Action—mild		Action—moderate	
Reaction—rare		Reaction—stimulation, insomnia, nausea	
GROUP II THENYL RING DERIVATIVES		**GROUP IV ETHANOLAMINE DERIVATIVES**	
Thenylene	(Abbott)	Benadryl	(Parke-Davis)
Histadyl	(Lilly)	Hydryllin	(Searle)
Diatrin	(Warner)	Decapryn	(Merrell)
Tagathen	(Lederle)	Action—strong	
Chlorothen	(Whittier)	Reaction—high incidence of sedation	
Action—moderate			
Reaction—mild sedation			

or not these pathologic conditions were due to the presence of an abnormal amount of histamine.

A further advantage of the vasoconstrictors is that, while they have side reactions, most marked of which are drowsiness and occasional nausea, these reactions are less frequent and less severe than those of other available drugs (table 2), which inhibit or decrease the parasympathetic activity. Actually, the ethylenediamine-thenyl ring compounds produce less drowsiness and less drying of the mouth, with rare exceptions, than do the atropine-like drugs such as Banthine. I am aware that a number of unfortunate and occasionally fatal side reactions of these drugs have been recorded; but considering the amount which has been used in the last few months, they can be regarded as relatively safe, inasmuch as the reaction rate is about the same as that of aspirin[6] (table 3). Good nasal vasoconstriction can be achieved by one of these drugs given orally in 85 per cent of patients.

Adrenalin-like drugs

A third and very useful group of drugs are those which have adrenalin-like reactions in the human body, including adrenalin itself, but principally ephedrine and its derivatives. Ephedrine, which produces vasoconstriction and a reduction of nasal turgor and discharge, was popularized after Chen and Schmidt isolated it in 1923. It can be administered either locally in the nose, or by mouth, and its effects do not seriously hamper the cilia when received by either route. A great many patients are hypersensitive to the stimulating effects of ephedrine, a fact which makes it a difficult drug to administer comfortably. Adrenalin itself is most helpful in severe attacks of nasal congestion and rhinorrhea, especially when

Table 3
Results of Antihistaminic Drugs in Controlling Nasal Congestion

Drug	*Cases Treated*	*Cases Benefited*	*Reactions Severe Enough To Demand Stopping Of Drug*
Diphenylamine hydrochloride ("Benadryl")	138	114 (83%)	12 (8.7%)
Tripelenamine hydrochloride ("Pyribenzamine")	301	265 (88%)	10 (3.3%)
Thenylpyramine hydrochloride ("Histadyl")	407	362 (89%)	14 (3.4%)
Methyl-phenyl-pyridendine Tartrate ("Thephorin")	61	46 (75%)	11 (18%)

Table 4
Results of Thenylpyramine Hydrochloride and Desoxyephedrine

	Cases Treated	*Cases Benefited*	*Reactions*	
Thenylpyramine hydrochloride	146	112 (76%)	Drowsiness	12
			Nausea	7
				19
Thenylpyramine hydrochloride and desoxyephedrine	173	152 (88%)	Insomnia	14
			Pain	6
				20

Table 5
Results of Ascorbic Acid in Antihistaminic Resistant Cases

Patients	Cured	Improved	Unimproved
Adults	6	3	4
Children	12	4	2

associated with severe allergic and asthmatic symptoms. However, this drug is not an oral preparation, and its secondary effects on the nose make it less useful than one might at first anticipate.

These drugs act by increasing pharmacologically the relative activity of the sympathetic system, thereby overshadowing any parasympathetic activity that may be responsible for nasal turgor and rhinorrhea. The ephedrine preparations are returning to popularity with certain workers who feel that the combination of a drug which stimulates sympathetic activity with a drug which reduces acetylcholine activity may be an ideal combination to control these symptoms. Inasmuch as a combination of drugs like these can be generally prepared in amounts which are synergistic, the unfavorable side effects of each of the drugs, therefore, can be avoided, and all of the de-

sirable direct pharmacologic effects obtained by a smaller dose of each drug.

We have been particularly interested in combining the activity of thenylpyramine hydrochloride with an ephedrine-like derivative, desoxyephedrine. This is at least as effective as thenylpyramine by itself, and has certain psychologic advantages in that it produces a sense of well-being in the patient, who generally has a feeling of mild depression as a result of the increased acetylcholine production in the body. We have found that 2.5 mg. of desoxyephedrine is a most satisfactory dose when combined with one of the other drugs producing acetylcholine depression (table 4). The preparation containing thenylpyramine hydrochloride and desoxyephedrine is not available commercially. However, there is available a preparation of thenylpyramine and ephedrine, in 25 mg. (3/8 grain) and 50 mg. (3/4 grain) capsules. The second capsule seems to me to be slightly stronger than is generally needed, and produces secondary ephedrine sensitivity phenomena which are usually undesirable. However, the efficacy of this combination is somewhat superior to thenylpyramine by itself, and a great deal superior to ephedrine without one of the thenylpyramine or ethylenediamine compounds.

The steroids and ascorbic acid

There is another group of substances which I feel belongs in the same class as ACTH and cortisone. It is rarely practical, for financial reasons, to resort directly to these drugs. In rare instances they prove useful, however, producing vasoconstriction in the nose and all other parts of the respiratory tract. They do so by enhancing the sympathetic activity, and therefore, if given in large enough doses, eventually overshadow any parasympathetic imbalance that may exist.

Of somewhat more practical value, but in the same category, is the use of ascorbic acid. This drug was used with considerable enthusiasm and success 15 and 10 years ago, before the discovery of some of the other vasoconstrictors. Ascorbic acid in large doses, 100 to 200 mg. every four hours, will produce vasoconstriction in many patients. This was somewhat of a mystery originally; but recent information concerning cortisone and the adreno-cortical steroids has shown the chemical similarity between the steroids and ascorbic acid to be striking. It is a useful presumption that doses of ascorbic acid far larger than the minimal vitamin requirements serve to enhance the supply of the steroids available to the patient.

A particularly useful development of this theory has been the combination of ascorbic acid with one of the other drugs which depress parasympathetic activity. Every practitioner has encountered patients who became refractory to one or another of the ethylenediamine, ethanolamine, or thenyl ring derivative vasoconstrictors. We have found it useful to change vasoconstrictors, and, if this is unsuccessful, to combine the vasoconstrictors with large doses of ascorbic acid. The results of this type of therapy are shown in table 5. The combination has been more successful in children, but we have had reason to use it more often in children than in adults, primarily because children develop more quickly a tolerance to ethanolamine derivatives especially. We do not think that 600 to 800 mg. of ascorbic acid a day in divided doses is too much for a child weighing 40 pounds.

Summary

The anatomy and physiology responsible for homeostasis of the mucous membrane of the nose have been presented, and some of the mechanisms responsible for vasocongestion and rhinorrhea have been discussed. Using this physiologic basis, we have mentioned some drugs which can be given orally to correct these symptoms. These drugs included both sympathomimetics—such as ephedrine, desoxyephedrine, adrenalin, and ascorbic acid—as well as the vasoconstrictors, commonly called antihistaminics. It has been suggested that a more accurate term for the antihistaminic drugs would be oral vasoconstrictors. Information suggesting that these latter type drugs may act by accelerating the activity of cholinesterase, thereby preventing a parasympathetic imbalance which results in nasal symptoms of congestion and rhinorrhea, has been presented.

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THE PHYSIOLOGIC CORRECTION OF INTERNAL AND EXTERNAL NASAL DEFORMITIES

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With the recent interest in rhinoplastic surgery has come a re-evaluation of the physiology and anatomy of the nose. It is apparent that nasal deformities involve the internal and external nose simultaneously and that in order to restore normal physiologic function in these cases, complete surgical correction must be done. In 1899, Killian described the technique of submucous resection for the surgical correction of septal deformities. This is the operation of choice for deviations involving the middle and posterior thirds of the septum. It is inadequate, however, in deviations involving the anterior and superior portions of the nasal septum.

The Anatomic Structure of the Nose

The external nose has the shape of an irregular three-sided pyramid. It consists of a bony and a cartilaginous portion covered by skin, subcutaneous tissue, and muscles. The bony portion consists of two nasal bones, which are oblong in shape, meeting each other in the midline at the internasal suture; laterally they articulate with the frontonasal process of the maxilla, and superiorly they articulate with the nasal process of the frontal bone.

The cartilaginous portion of the nose is made up of five major cartilages. The two upper lateral cartilages are roughly triangular in shape, and may be thought of as lateral expansions of the septum. Each upper lateral cartilage attaches superiorly to the under surface of the nasal bone and frontonasal process of the maxilla, and medially to the septal cartilage and to each other. Inferiorly, each is attached by a firm aponeurosis to the lateral crus of the lower lateral or alar cartilage, and is overlapped by it.

The two lower lateral or alar cartilages consist of a medial and a lateral crus, and the angle of their junction determines the shape of the tip of the nose. The medial crura are bound together by fibrous tissue of the columella. The lateral crus is oval in shape, and extends into the fibrofatty tissue of the ala nasi. Lesser alar cartilages are frequently present as lateral extensions of the lateral crus.

The septal cartilage forms the anterior part of the septum of the nose. It is quadrilateral in shape and fits into the triangular space of the bony septum posteriorly. Its posterosuperior border is attached to the perpendicular plate of the ethmoid bone, and the postero-inferior border joins the vomer and the anterior part of the crest of the maxilla. The superior margin of the septum extends from the internasal suture to the septal angle, and the anterior margin extends to the anterior nasal spine. The upper lateral cartilages are attached superiorly, but in their lower half are separated from the septum. The anterior border of the septal cartilage is connected to the medial crura by the membranous septum.

The Role of the Septum

Fomon states that "the septum under static conditions does not furnish support to the nasal pyramid but acts only as a reserve safety factor."[1] He claims that any part of the septum may be resected if provision is taken to prevent subsequent scar contractions. The configuration and support of the nasal dorsum is dependent upon the interrelationship of the nasal bones, the upper and lower lateral cartilages, and the cartilaginous septum. In some noses the superior border of the septal cartilage can be felt along the dorsum to a point where the septal angle joins the alar cartilage. The septal angle is immediately subcutaneous between the upper lateral and alar cartilages, and can be felt immediately if the tip of the nose is depressed. The anatomic defects that may cause this depression are: (1) the upper lateral cartilages may be too short and do not attach properly to the alar cartilages; or (2) they may diverge from the septal cartilage and attach more laterally to the lateral crus of each alar cartilage. In either instance, a weak triangle is present, and the complete or even the high removal of septal cartilage will cause a loss of support which

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can be felt at the time of operation and which, with scarring, will result in a saddle nose, often with drooping of the tip and later retraction of the columella.

Physiology of the Nose

To examine the nose properly, it should be inspected or observed during quiet and forced inspiration and expiration prior to the introduction of a nasal speculum. The examining speculum may correct the deformity of the nasal tip so that the whole abnormality goes unrecognized. Many times we grasp a nasal speculum, insert it into the naris, and observe the condition of the internal nose, with complete disregard of one of the most important areas—namely, the limen or nasal pinch-cock, which is situated 1 cm. from the external naris, and is formed by the inferior margins of the upper lateral cartilages and the septum. The extreme importance of this area to normal respiration is becoming more apparent. There are patients who have had rhinoplastic surgery with satisfactory cosmetic but poor functional results. Too often nasal physiology has been disregarded and the esthetic factor made the chief aim. Since nasal physiology is dependent upon the anatomic relationship of the internal and external nose, rhinoplastic surgery should be done only by those familiar with nasal physiology and anatomy.

Nasal Functions

The physiologic functions of olfaction, conditioning of the inspired air, and the self-cleansing action of the nose are well known to rhinologists. In order that these functions be performed, the inspired air must reach the proper areas of the nose. According to Proetz: "the inspired air is directed upward toward the roof of the nose by virtue of a constriction 1 cm. from the anterior naris. As it reaches the vault, it is directed sharply backward and downward in a parabolic curve, fanning out as it approaches the posterior naris or choana. The main current passes through the olfactory fissure close to the septum and only an insignificant portion of the air enters the meatuses.

"The expired air traverses much the same pathway in the reverse direction except that, owing to the disproportionate sizes of choana and anterior naris, a large eddy current occurs which occupies most of the nasal chamber. In this case, air enters the meatuses both from the choana and from the eddying currents below."[2]

Humidification, warming, and cleansing of the inspired air, is accomplished while it traverses this course. The air is humidified to about 90 to 95 per cent relative humidity, chiefly by moisture from the seromucinous glands. Traina (as cited by Eggston and Wolff[3]) showed that regardless of external temperature, from zero to 25 C., there was less than 1 C. difference when the air reached the pharynx.

Fomon[4] has called attention to the fact that the nose acts as an efficiency regulator of respiration. In quiet respiration, there is little or no motion of the external nose; however, on forced nasal respiration, the upper lateral cartilages swing toward the septum, thus narrowing the limen and increasing resistance to the ingress of air. This motion (1) prevents air from entering the nose too rapidly and allows sufficient time for proper air conditioning; (2) places an optimal load on the respiratory muscles, causing a more forceful contraction with an increased depth of respiration; and (3) allows sufficient time for alveolar exchange. Complete closure of the limen is prevented by the alar cartilages, which are attached to the upper lateral cartilages by a strong aponeurosis. On forced inspiration the nares dilate by action of the dilator nares anterior and posterior, and the caput angularis. This draws the ala outward, stretching the aponeurosis, and prevents closure. That these muscles do bring this about was shown by Van Dishoeck[5] (as cited by Fomon) in observations in unilateral facial paralysis. In quiet respiration there was no difference in pressure between the two sides; however, on forced inspiration the negative pressure on the normal side was minus 5.5 and on the paralyzed side it rose to minus 19 cm. of water, showing the effect of the collapsed ala.

Nasal resistance is so important to proper respiration that mouth-breathers try to emulate it by narrowing the lips and teeth to a small chink and by applying the tongue to the hard palate. Mouth-breathers have a more rapid and shallow respiration and, consequently, a deficiency in lung ventilation. Nasal respiration is smooth and regular, and passes almost unnoticed from inspiration to expiration.

Variations in the Underlying Nasal Anatomy

Deformities of the columella, ala nasi, or anterior portion of the septal cartilage may

cause nasal obstruction and alter nasal physiology. Each of these types will be discussed, but it is obvious that a deformity usually involves two or more of them.

The contour of the columella depends on the size and shape of the medial crura of the alar cartilages, the interposed fibrous tissue, and the inferior nasal spine of the maxilla. The medial crura may be (1) long, producing narrow nostrils; (2) short, producing transverse elliptical nostrils; or (3) widely separated because of interposed fibrous tissue or a thick anterior nasal spine. The columella may be retracted as the result of dislocation of the inferior margin of the septum or complete removal of the septal cartilage during a submucous resection.

The contour of the ala nasi is determined by the lateral crus of the lower lateral cartilage. It may be concave, producing a narrow or slit-like nostril, or convex, producing a transverse elliptical or negroid nostril.

Various authors have attempted to classify nasal septal deformities. Deviations of the septum are so varied and complex, however, that an adequate classification is difficult.

Deformities of the columella and ala nasi not associated with a septal deviation are correctible by rhinoplastic surgery. Their correction is not as important to the practicing rhinologist, however, as those associated with deflection of the anterior portion of the nasal septum. This causes both functional disturbance and cosmetic deformity.

Because of old teachings, anterior septal dislocations have been only partially corrected many times from fear of causing a saddle nose, drooped tip, or retracted columella postoperatively. The co-existing deformity of the tip, nares, and columella has been completely neglected. The typical picture of this deformity is as follows: The inferior border of the septum has become subluxated out of the vomerine groove; the anterior free margin has pulled the membranous septum from the columella, deforming it; the free margin of the septum projects into the nostril, frequently completely obstructing it. In the opposite nostril the septum is again deviated, obstructing the naris in the region of the limen. The upper lateral cartilages are distorted with angulation. The lower lateral cartilages are pushed or pulled out of line, deforming the nostrils; and, with change in the septal angle plus distortion of the lower laterals, there is drooping of the tip and often retraction of the columella.

This deformity in varying degrees is not uncommonly encountered, and can be completely corrected with a restoration of function and cosmetic improvement. Recognizing the deformities that occur in the more complex cases, it is impossible to restore complete physiologic function by merely resecting a portion of the septal cartilage; the deformities of the upper and lower laterals must be corrected.

Surgical Techniques for the Correction of Deformities

Several techniques have been advocated for correction of deformities of the anterior portion of the septal cartilage.

1. Metzenbaum[6] attempted to replace the septum in midline by a swinging-door technique. The mucoperichondrium is elevated on the side of the angle of deflection. The cartilage is freed posteriorly by an incision through to the opposite mucoperichondrium. Inferiorly, the septum is freed from the vomer and the crest of the maxilla, and swung back to midline after the superior portion of the septum has been cross-hatched or cut. This procedure is applicable to some deformities, but the results are often disappointing because it does not take into consideration other co-existing deformities, particularly that of the upper lateral cartilage, which brings about unequal pull on the replaced septum, often causing the septum to return to its previous position. Also, if the septum is thick and overlapped or fragmented, swinging it back to midline will not correct the nasal obstruction.

2. In the Galloway[7] procedure, an incision is made on the right side of the membranous septum posterior to the posterior border of the medial crus of the lower lateral cartilage. A bed is created in the columella between the medial crura. The obstructing cartilage is removed, and a piece of the resected cartilage or preserved cartilage is re-inserted between the septal flaps and into the bed created in the columella. The graft should not extend posteriorly beyond the inferior margins of the upper laterals where they attach to the septum. The cartilage is brought into the columella by guy sutures, which are removed after the graft has been anchored by mattress sutures.

The Galloway procedure, or a modification of it, will correct anterior septal deformities

without associated tip and upper lateral cartilage deformity. When these occur they can be corrected with complete restoration of function and with an improved cosmetic appearance by a rhinoplastic approach.

3. Seltzer[8] advocates a swinging-door method of correction. The intercartilaginous incisions are made, the skin and subcutaneous tissue are elevated from the dorsum, and transfixation of the nose is then completed. The upper lateral cartilages are severed from the septum. An incision is made in the mucoperichondrium anterior to the angle of deflection, and elevation of the septal flap is made beyond this angle. The cartilage is incised from the dorsum to vomerine groove, just anterior to the angle of deflection. A similar incision is then made about 1 to 5 millimeters parallel and anterior to it. Care is exercised not to cut the mucoperichondrium on the opposite side. With a comma-shaped hook the intervening cartilage is removed. The base of the septum is freed by an anteroposterior incision along the nasal floor to the opposite mucoperichondrium. The anterior cartilage is thus freed, and can be easily shifted to midline. The upper lateral cartilages are trimmed and sutured, and the septal cartilage is sutured to the membranous septum. This method is excellent for deformities in which the septal cartilage is not fragmented, overlapped, or markedly thickened.

4. Fomon[9] advocates first incising the right side of the membranous septum and inserting a batten into a created pocket in the columella and anchoring it with mattress sutures. The transfixation of the nose is completed and resection of obstructing cartilage is done, irrespective of its location. Associated deviations of the ethmoid plate and vomer are corrected by the Killian procedure. Small cartilage grafts are inserted between the septal flaps, particularly along the dorsum, to prevent scar contractions. Correction of the upper lateral cartilage deformity will depend on the necessity of resecting the septum in this region. If a high resection is necessary, the upper laterals are submucously severed from the septum and trimmed and fashioned as necessary; if a high resection is not necessary, the upper laterals, including the mucous membrane, may be cut, trimmed, and then resutured.

Many other techniques have been described for the correction of anterior septal and tip deformities, but each case needs individual study to evaluate the deformity properly and select the correct technique. The following cases present some of the typical deformities and their correction.

Illustrative Cases

Case 1 represents a congenital deformity with subluxation of the septal cartilage from the vomerine groove; the anterior free margin projects into the left naris. The right naris is distorted with partial collapse of the ala on forced inspiration. The dorsum is deviated to the left. Correction was obtained by the Seltzer technique.

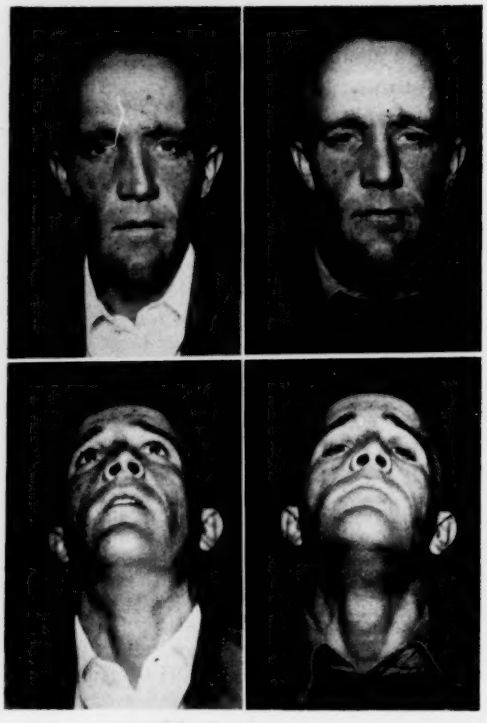

Fig. 1 (Case 1).

Case 2 presents a traumatic deformity with a C-shaped deviation of the nasal dorsum and subluxation of the septal cartilage, with the free margin projecting into the right naris. There is associated tip deformity. This was corrected by a complete rhinoplasty, plus resection of a portion of the cartilaginous septum and the anterior nasal spine, with a batten placed in the columella.

Case 3 presents the typical saddle nose and

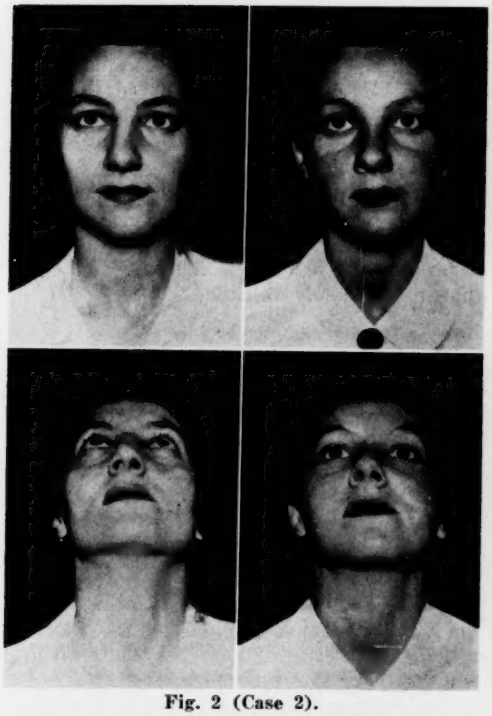

Fig. 2 (Case 2).

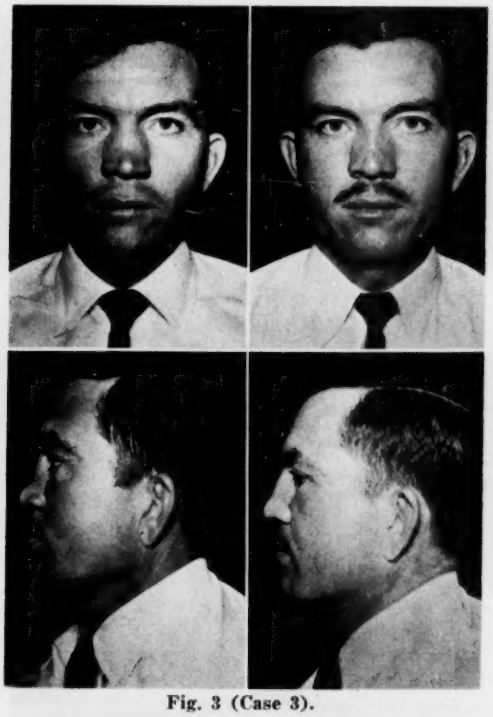

Fig. 3 (Case 3).

Fig. 4 (Case 4).

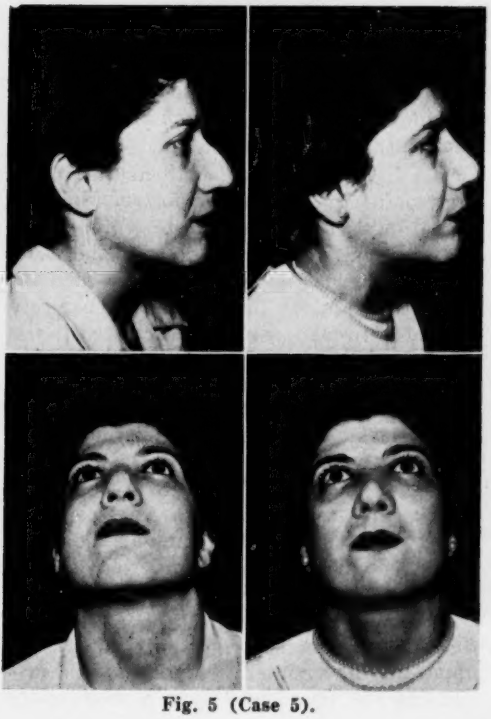

Fig. 5 (Case 5).

Fig. 6 (Case 6).

retracted columella which followed a submucous resection. Correction was obtained by a dorsal cartilage implant and a batten placed in the columella.

Case 4. This patient complained of external nasal deformity and nasal obstruction. Examination revealed a moderate septal deviation, especially along the floor of the nose, plus an external nasal deformity which included a pendulous tip. Because a moderate amount of breakdown was anticipated in the rhinoplasty, the submucous resection was deferred. Following the cosmetic reconstruction, the patient was subjectively relieved of his nasal obstruction. This relief may have been partly psychological, as a complete change in facial expression will be noted; however, it was partly obtained by the elevation of the tip and widening of the nasal dorsum, which changed direction of the inspired air.

Case 5 represents a routine rhinoplasty for deformities involving particularly the upper and lower lateral cartilages. The profile and full face views show a satisfactory cosmetic result; however, the base view reveals a pinched tip, with partial collapse of the ala nasi. The patient now complains of slight nasal obstruction or forced inspiration. This deformity will be subsequently corrected with small cartilaginous implants into the ala nasi.

Case 6 is presented to show the change in facial expression following a typical rhinoplasty. You will note that the face appears softer and the eyes, lips, cheeks, and chin appear completely relaxed.

Summary

A review of the anatomy and physiology of the nose is given. It is apparent that deformities of the internal and external nose occur simultaneously, and that to restore physiologic function in these cases, complete surgical correction must be done.

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Hypertension is one of the commonest disorders of civilized life and results in the greatest burden of cardiovascular disease. After it has run its course of several years to a decade or more, it results in certain vascular changes that, in turn, produce changes within vital organs and bring about disability and death. We do not know much about the disease in spite of the epochal work of Goldblatt and his associates, and many others, regarding the disturbances of renal blood flow. This knowledge really has not advanced us very far in our treatment of this disorder. On the contrary we think it has hampered us in one respect because it has placed even more emphasis on the physical aspects of the disorder. For years we have studied patients with hypertension with the blood pressure apparatus, ophthalmoscope, fluoroscope, electrocardiograph, and by means of renal function studies; now we have added the intravenous urogram and, in certain clinics, more refined methods of studying renal blood flow. All this is proper but it is just the beginning; it is not the end of the study because patients with hypertension are usually anxious patients and their anxiety has some relation to the blood pressure.—Weiss, E.: Emotional Factors in Cardiovascular Disease, Springfield, Ill., Charles C. Thomas, 1951, chap. 6, p. 44.

CARBON DIOXIDE RETENTION DURING OXYGEN THERAPY

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The lungs have the function of eliminating carbon dioxide, as well as of absorbing oxygen. Failure to eliminate carbon dioxide properly does not often constitute a problem during pulmonary disease, because failure of oxygen absorption usually becomes critical first. There are several reasons for this. In the first place, tolerance to carbon dioxide excess develops more easily than tolerance to oxygen lack. Secondly, carbon dioxide has certain advantages over oxygen in the mechanics of gas exchange in the lung. For an equal difference in gas pressure between blood and air, it diffuses about 25 times more rapidly between blood and alveolar air than oxygen does[1] in the reverse direction. Further, overventilation of one part of a lung can make up for underventilation in another part with regard to the elimination of carbon dioxide, but not to the absorption of oxygen. Although very large quantities of carbon dioxide can be "blown off" by hyperventilation, little extra oxygen can be absorbed by this means. The amount of oxygen that can be taken up is limited by the hemoglobin content of the blood. For this reason, patients with cyanotic congenital heart disease usually have a normal blood carbon dioxide content and tension, while the per cent oxygen saturation of the arterial blood may be greatly reduced below normal.

Oxygen therapy can overcome or greatly improve deficient oxygen absorption. Since there exists no similarly effective means by which carbon dioxide elimination can be facilitated, however, the problem may gradually become critical in patients with progressive pulmonary disease who are being given continuous oxygen therapy.

The carbon dioxide tension of blood and body tissues may also increase rapidly when oxygen therapy is started on a cyanotic patient with chronic pulmonary disease. In the course of the disease, such patients have become accustomed to high tensions of carbon dioxide, and the respiratory center is no longer normally sensitive to this gas. Instead, much of the respiratory stimulus is being supplied by the low arterial blood oxygen tension, presumably acting through the arterial chemoreceptors. When this stimulus is abruptly removed by oxygen therapy, respiration is markedly slowed. The blood carbon dioxide tension will then rise rapidly.

Motley[2] has pointed out that this course of events is probably responsible for occasional untoward reactions to oxygen therapy. Carbon dioxide, in sufficiently high concentrations, is a depressant rather than a stimulant[3]. In patients who are insensitive to the stimulating effects and whose respiration is depressed by oxygen, carbon dioxide may reach toxic levels during oxygen therapy.

The present report deals with four examples of the development of a high blood carbon dioxide tension during the course of oxygen therapy. The methods used in analysis of arterial blood gases have been described elsewhere[4].

Case Reports

Case 1

The patient, a 31 year old man, died in June, 1950. He had had tuberculosis for 11 years. In November, 1948, a left thoracoplasty was done, leaving him short of breath. Fibrosis was present throughout the right lung, and the respiratory excursion of this side was much below normal.

A year before death he had settled into a bed and chair existence, with oxygen always available for self-administration. At this time his insistence on oxygen therapy prompted a study of arterial blood gases to determine his real need for oxygen. As shown in table 1, shutting off the supply of nasal oxygen caused a large drop in arterial oxygen content. The patient became dyspneic. When oxygen was given again, his breathing became quiet and comfortable. The arterial carbon dioxide tension was very high while the patient was breathing quietly on oxygen. While he was hypoxic and dyspneic, it was reduced a little, presumably by the increased ventilation. The patient was evidently quite tolerant to high carbon dioxide tensions.

He gradually became weaker, more lethargic, and more dyspneic. In April, 1950, the studies were repeated (table 2). The ability to excrete carbon dioxide was still further reduced. The arterial carbon dioxide tension, under oxygen therapy, rose to about three times normal.

One month later, he was admitted for the last time. He was given oxygen continuously, and was very weak and lethargic. On one occasion he was

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Table 1
Arterial Blood Gases in Chronic Pulmonary Disease
Case 1 (July, 1949)

Comment	Arterial O_2, Per cent Saturation	Arterial pH	Arterial CO_2 Pressure (mm. Hg.)*
Nasal oxygen, 3 liters per minute	99.7	7.27	81
On air, 10 minutes	79.1		
On air, 30 minutes	78.4		
On air, 60 minutes	71.8	7.34	67

* Normal arterial CO_2 pressure is 40 mm. Hg.

found to be unresponsive, and was breathing at a rate of 6/minute. Oxygen was shut off, and he quickly became cyanotic, began breathing more rapidly and deeply, and regained consciousness. One further examination of arterial blood a few days before death showed an oxygen saturation of 97.3 per cent, a pH of 7.26, and a carbon dioxide tension of 123 millimeters of mercury. Addition of 5 per cent carbon dioxide to the nasal oxygen for three minutes raised the arterial carbon dioxide tension to 131 millimeters of mercury, but produced no evident clinical change.

This case is an example of progressive pulmonary failure and loss of the ability to excrete carbon dioxide, with resultant, severe respiratory acidosis, in a patient who was kept alive for many months by oxygen therapy. It also illustrates loss of respiratory sensitivity to carbon dioxide, and demonstrates the rapid rise of carbon dioxide tension which can occur when the respiratory stimulus of such a patient is suddenly reduced by oxygen therapy. The terminal lethargy and weakness, and the brief episode of coma are thought to have been caused by high carbon dioxide tension.

Case 2

A 24 year old woman had had attacks of asthma since childhood. She was brought to the hospital during a severe attack, and became comatose shortly after admission. Arterial blood studies were made after she had been comatose for 18 hours. These studies are summarized in table 3. She died 24 hours after the last study. It is apparent that oxygen therapy was necessary, and that the carbon dioxide tension had become extraordinarily great.

Case 3

A 64 year old man for 30 years had had severe attacks of asthma, during some of which he became disoriented. He was brought to the hospital with severe asthma, improved for a few days, and then relapsed and became comatose. He was given continuous oxygen therapy and had frequent bronchoscopic aspirations. He remained comatose for four to five days, during which he had several short, generalized convulsions. He gradually improved and finally made a complete recovery. Blood gas studies made on this patient are summarized in table 4.

Table 2
Arterial Blood Gases in Chronic Pulmonary Disease
Case 1 (April, 1950)

Comment	Arterial O_2, Per cent Saturation	Arterial pH	Arterial CO_2 Pressure (mm. Hg.)
On air, 3 minutes	75.3	7.27	91
On air, 6 minutes	69.4	7.29	84
On air, 10 minutes	67.2	7.30	81
O_2, 2½ minutes	98.1	7.24	97
O_2, 6 minutes	99.3	7.19	113
O_2, 12 minutes	100.0	7.17	125
O_2, 18 minutes	100.0	7.17	124

Table 3
Arterial Blood Gases During Severe Asthma
Case 2

Comment	Arterial O_2, Per cent Saturation	Arterial pH	Arterial CO_2 Pressure (mm. Hg.)
Patient comatose; On 50% oxygen, 50% helium	98.9	7.02	129
Five hours later, after administration of sodium lactate; patient comatose.			
On nasal O_2	94.6	7.04	155
Off oxygen 10 minutes	55.6	7.10	134

Table 4
Arterial Blood Gases During Severe Asthma
Case 3

Comment	Arterial O_2, Per cent Saturation	Arterial pH	Arterial CO_2 Pressure (mm. Hg.)
Second day of severe attack; patient comatose; on nasal oxygen	95.2	7.15	140
Seventh day. Patient responsive.			
Nasal oxygen	97.9	7.49	52
No oxygen	89.8	7.54	46

In patients 2 and 3, carbon dioxide tension became very high during severe, prolonged bronchial asthma. With oxygen therapy, both these patients maintained good arterial oxygen saturation. It is our belief that the comatose state of these patients resulted, at least in part, from their high blood and tissue carbon dioxide tensions.

Case 4

The patient, a 36 year old woman with anterior poliomyelitis, spinal and bulbar, was kept continuously in a Drinker respirator over a period of many

Table 5
Arterial Blood Gases of Patient in Drinker Respirator
Case 4

Comment	Arterial O_2, Per cent Saturation	Arterial pH	Arterial CO_2 Pressure (mm. Hg.)
Oxygen administered by catheter into tracheotomy tube	96.4	7.26	88
Oxygen stopped for 5 minutes; respirator operating at same rate and pressure	59.5	7.26	90
Oxygen on 5 minutes; respirator operating as before	94.6	7.27	86

weeks. A tracheotomy had been done, and oxygen was being given by catheter through the tracheotomy tube. She had recovered from bronchopneumonia, and was thought to be doing well. She was stronger physically, fever had nearly disappeared, and a chest film showed that the pneumonia had cleared.

The patient then began to develop psychotic traits. She became very apprehensive, was disoriented at times, had definite delusions, and was thought by her physician to be having hallucinations. She was not cyanotic, and blood glucose was normal.

About ten days after this change in mental status was first noted, arterial blood gas studies were done (table 5). The carbon dioxide tension was very high. Arterial blood oxygen was normal while oxygen was being supplied by catheter. When the oxygen was shut off and the patient breathed air, the blood oxygen fell very rapidly. It was apparent that the respirator was not providing adequate ventilation. Cyanosis had not appeared, because extra oxygen was being supplied. Although carbon dioxide had accumulated to about twice the normal tension, the resultant symptoms were not easily identified as coming from respiratory insufficiency. It was found that the carbon dioxide combining power of the plasma had risen from approximately 60 volumes per cent two weeks before to 95-105 volumes per cent. It then appeared that the pressure gauge on the respirator had become defective and was registering a greater pressure differential than actually existed. The respirator was adjusted to provide adequate ventilation. Within a very short time the patient became oriented, pleasant, and optimistic, and this improvement persisted. In a week the carbon dioxide combining power had fallen to 72, and in two weeks it was 62 volumes per cent.

This case represents a lower grade of carbon dioxide toxicity than the preceding cases. It is nevertheless significant as an example of preventable carbon dioxide poisoning.

Summary

Four cases in which very high carbon dioxide tensions developed in patients with pulmonary disorders who were being given oxygen therapy are presented. These patients had mental disturbances, lethargy, and coma.

Carbon dioxide poisoning can easily occur during prolonged oxygen therapy, and its recognition can clarify situations which may appear quite puzzling.

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THE BLACK WIDOW SPIDER BITE SYNDROME

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SHALLOTTE

The black widow spider *(Latrodectus mactans)* is found in North, Central and South America, and has been reported in all but seven of the United States[1]. This wide geographic distribution makes the black widow spider bite syndrome important to all physicians, especially to those in rural practice, as these cases are seen mostly in rural areas. In 1948, 400 cases of black widow spider bite, with 16 deaths, had been reported in the United States[2], but no mention was made of the time period covered by this report.

In three years of general rural practice in Southeastern North Carolina I have seen 18 cases of black widow spider bite. From a comparison of these cases with the current literature on the subject, I feel that there is in the literature much confusion on the treatment and recognition of this syndrome.

Clinical Observations

In this series of 18 cases, 12 occurred in white and 6 in Negro patients. Five cases occurred in females and 13 in males. The age incidence ranged from 2 to 55 years, the greatest frequency being in the years of greatest activity. There was no correlation between severity of symptoms and age, sex, or race. It seems logical to assume that the severity of symptoms is related only to the amount of venom injected by the spider, and perhaps to the individual susceptibility of the patient.

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The popular conception that most cases occur while the patient is using a privy, and that bites on the buttox and genitalia are most common[3] was not borne out by this series. In the 8 cases in which the location of the bite was noted, only one was on the penis, six were on the extremities, and one on the abdomen. Those on the upper extremity had been received while the patient was picking up sticks and firewood, and those on the toes while putting on shoes that had not been worn recently.

Diagnosis

The classic picture of the black widow spider bite syndrome is well known[1, 4]. However, the major symptoms vary in severity and type, and may be completely atypical. Usually they start as severe pains in the bones, muscles, and joints. If an extremity is the site of the bite, pain usually starts in that extremity and rapidly travels to the back and abdomen, where it settles and predominates. Although pain in the back or extremities may predominate, in most cases the abdominal pain is so severe that it will mask all other pain. The patient is usually doubled up and thrashing in pain. Severe shock may or may not be present. Vomiting is often present, but rarely severe. Although I have seen one case in which the abdomen remained soft and moderately tender in spite of severe abdominal pain, vomiting, and diarrhea, there is usually some degree of abdominal rigidity. The abdomen is frequently board-like, resembling that seen with a ruptured peptic ulcer, and many of these patients have been mistakenly subjected to surgery.

This difficulty of diagnosis occurs because the patient often does not recall having been bitten, as the initial sting is mild and the spider may not have been seen. The patient should be asked specifically if he had any burning or stinging sensation some time prior to the onset of the presenting symptoms. Then he will often recall the sting, and close examination will reveal the site of the bite. The actual bite varies in size and appearance from a small macule, often smaller than a matchhead, to a wheal the size of a quarter.

Following the initial bite is a latent period varying from about 15 minutes to four hours before the severe symptoms occur. In the average case this period is about a half an hour. The longer the latent period, the less likely is the patient to remember the bite. One patient in this series for more than 12 hours emphatically denied having been bitten. His symptoms were not typical, and, although a spider bite was suspected, the diagnosis was discarded and the patient continued to have severe pain despite morphine and symptomatic therapy. When he finally recalled having been stung under his fingernail by some insect, specific therapy was instituted and he rapidly got well.

Black widow spider bite should always be considered in the differential diagnosis of severe abdominal pain. A carefully obtained history, recalling to the patient his bite, will often avert a grave surgical error. The patient's history and location of the site of the bite may be the only differential clinical points between these two conditions. A high index of suspicion on the part of the physician is often necessary to establish a diagnosis.

Treatment

On the subject of treatment the literature is confusing and misleading. I contend that the treatment of the black widow spider bite is simple, easy, and definitive; that it is an office procedure; and that rarely, if ever, should hospitalization be necessary. Adequate relief is obtained only by the use of specific antivenin, of which more will be said later. In the early cases of this series, before specific therapy was used, the duration of symptoms varied from 12 to 211 hours. It is probably the variation in the natural length of the syndrome that accounts for many of the published successful treatments of individual cases.

Bell and Boone[5] report one case successfully treated with neostigmine methylsulfate and atropine after six and a half hours of severe pain. I have tried this in one case and was not impressed with the result. Davis[6] states that the spider toxin acts like an overdose of strychnine or physostigmine and recommends treatment with curare or similar drugs. I have had no experience with this method, but feel that the new curare derivatives might be useful in combating the spasm and pain. Morphine is recommended for the relief of pain[7]. I have used both morphine and Methadon and find that, while they do lessen the pain to a varying degree, they do not give complete relief. If morphine is used it should be given intravenously in order to avoid a cumulative effect. Antihis-

taminics proved to be of no value in my hands.

Calcium gluconate or magnesium sulfate given intravenously is widely recommended[1,2,4b,6,7a,8]. These are excellent drugs for relieving pain and spasm, but the relief given is transient, lasting only from five to 30 minutes. It is necessary to keep repeating these injections until the syndrome reaches its natural termination, as these drugs in no way neutralize the spider toxin. This type of treatment is necessarily prolonged, and often requires hospitalization and more or less constant attention. If this type of treatment is used, the alternate injection of 10 cc. of a 10 per cent solution of calcium gluconate and 2 cc. of a 50 per cent solution of magnesium sulfate as needed is probably better than the administration of just one of these two drugs. In the absence of specific therapy, this is probably the best treatment.

Although specific therapy is recommended by many authors, the impression is given that it is not available. Black widow spider antivenin* is a stable, dried horse-serum preparation with a five year expiration date. Any doctor practicing in a rural area can keep a small stock on hand, so that it will be available when needed. The price is not prohibitive. I have used antivenin in my last 9 consecutive cases, and am convinced that it is the best rapidly effective treatment known today. All the patients given antivenin were treated in the office, and no hospitalization or prolonged care was required.

My routine technique is adapted from Miller[9], whose treatment is based on 10 years of experience with this syndrome. On diagnosis, 10 cc. of a 10 per cent solution of calcium gluconate or 2 cc. of a 50 per cent solution of magnesium sulfate is given intravenously to relieve the pain. While this is in effect the patient is tested for serum sensitivity, then one vial of antivenin is given intramuscularly. Usually this is all that is necessary. It is advisable, however, to tell the patient to stay in town, or at least be available, as occasionally more antivenin is needed.

The antivenin as packaged today is dry, and is accompanied by 2.5 cc. of distilled water into which it is to be dissolved. I find that it takes too long for the serum to dissolve in this little water and prefer to use 5 cc. of distilled water instead.

*Antivenin *Latrodectus mactans* is distributed by Sharp & Dohme, Co., Philadelphia.

Results

In 7 of the 9 cases, this was all the treatment required. In 1 patient, pain returned immediately after the injection of antivenin, and a second ampule of calcium gluconate was needed to tide him over until the antivenin took effect. One patient required a second ampule of antivenin four hours after her first one. She was fairly comfortable during most of those four hours, and had no trouble after her second injection.

Two patients developed mild serum sickness three and five days respectively after the serum was given. These reactions were easily controlled with antihistaminics. No patient in this series was serum sensitive to the test dose. Should this occur, I would not hesitate to give the antivenin after properly desensitizing the patient. Repeated intravenous injections of calcium gluconate or magnesium sulfate would keep the patient comfortable until desensitization could be accomplished.

Two patients received antivenin within 35 minutes of the bite. In one case the pain was just starting, and was successfully aborted. In the other case the antivenin was given 25 minutes after the bite and before the onset of severe symptoms. This patient had no symptoms at any time other than the transient sting of the bite.

Summary

1. With the wide geographic distribution of the *Latrodectus mactans*, the black widow spider bite syndrome is likely to be seen by the rural practitioner.

2. Because of the immediate trivial symptoms, the bite may not be noted by the patient. Therefore, in many cases, a high index of suspicion must be exhibited by the physician in order to make the diagnosis. Black widow spider bite must always be considered and carefully ruled out in the differential diagnosis of the acutely painful abdomen.

3. In spite of the enthusiastic reports favoring the intravenous administration of calcium gluconate and magnesium sulfate, these drugs are palliative at best and will not shorten the duration of the illness nor prevent hospitalization.

4. The use of specific antivenin is the best treatment to date. It is inexpensive, easy to administer, and definitive. With the use of

antivenin, treatment of the black widow spider bite becomes an office procedure, and prolonged morbidity and suffering are avoided.

5. Rural practitioners should keep a stock of antivenin on hand, so that it will be available when needed.

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COMPLICATIONS OF POISON IVY (*Rhus Toxicodendron*) DERMATITIS

SHERWOOD W. BAREFOOT, M.D.

GREENSBORO

Poison ivy dermatitis is usually considered to be an annoying but benign condition. In general this is true, since the national incidence is estimated at 350,000 cases per year[1], and significant complications are seldom seen.

The dermatitis of poison ivy is indistinguishable from that of poison oak. Poison ivy (*Rhus toxicodendron*), however, is a trifolate vine found from the Atlantic coast to the Rocky Mountains, while poison oak is a trifolate shrub occurring from the Rocky Mountains to the Pacific coast. In both instances the dermatitis is produced by the intense irritating properties of urushiol (labinol, toxicodendrol)[2], found in the leaves, bark, roots, fruit, and flowers of these plants.

An analysis of the types of complications which might occur may suggest means of preventing many of them and an intelligent management of those with which we are faced.

The accompanying outline suggests a classification of the types of complications which may develop.

Table 1

I. Skin Complications
   - A. Secondary infections
   - B. Development of "eczema"

II. Renal Complications

III. Systemic Complications

IV. Therapeutic Complications
   - A. Dermatitis venenata from local treatment (treatment dermatitis)
   - B. Dissemination of eruption from injections of Rhus extracts
   - C. Toxic psychosis from injections of Rhus extracts

Skin Complications

Skin complications are by far the most numerous with which we have to deal, particularly those caused by secondary infection.

Secondary infections

Unless the bullae and vesicles are treated appropriately, micro-organisms may gain a foothold and dominate the picture. If secondary invading micro-organisms become sufficiently entrenched, an impetigo-like process may develop; or an infectious eczematoid dermatitis may result from the staphlyoccoci and/or streptococci through their own "eczematoid"-producing abilities.

Many patients who present themselves with pus-filled blisters, are in need of penicillin and wet compresses rather than the injections of poison ivy extracts which they may have been receiving.

Development of "eczema"

An acute vesico-bullous dermatitis venenata may be followed by a chronic dermatosis, which we shall refer to by the vague term, "eczema." In such instances, the dermis rather than the epidermis becomes the main shock tissue to moderate exposures of *Rhus toxicodendron*, and the clinical picture may be that of pale erythematous lichinified lesions, either dry or moist. On heavy skin contamination with Rhus in such cases, however, the epidermal reaction, as manifested by vesicles and bullae, again predominates.

Ascorbic acid has been advocated in the treatment of Rhus dermatitis on the theory that it might inhibit histamine, interfere with the allergic reaction, and maintain vascular tone[3]. This has proved worthless in my experience, with the possible exception of 2 cases of chronic "Rhus eczema." The history of one of the cases follows below. I believe that these patients are more likely to be helped by desensitizing to extracts of

Read before the Section on the Practice of Medicine and Surgery, Medical Society of the State of North Carolina, Pinehurst, May 8, 1951.

Rhus toxicodendron than are patients subject to the usual acute poison ivy vesicobullous dermatitis. Antihistamine drugs seem to be helpful in controlling pruritus in such patients.

Case report

Each spring for the previous 12 years a 40 year old white woman, who was first seen in July, 1949, had developed a vesicular dermatitis on various exposed parts of the body. From early spring until late fall, she experienced areas of persistent, more or less dry eczematoid dermatitis, which were usually on the face and arms. Occasionally there would be fresh crops of vesicles which she usually associated with contact with her young child, who had never had poison ivy, after he had played out-doors. Conscious of the fact that even the slightest exposure to poison ivy on her part would result in violent blistering dermatitis, she avoided such exposures to the best of her ability. On several occasions, she had taken "poison ivy injections" after the dermatitis had developed, and she felt that she had always been benefited by them.

The present episode had commenced about three months previously. In the beginning the eruption had been vesicular, but had become "chronic" and itched intensely.

The patient's general health was good. There was no personal nor family history of asthma nor hay fever. She had experienced no other skin affections.

Physical findings: Examination of the skin showed a moist eczematoid dermatitis involving all surfaces of the arm in the region of the right elbow. There were linear erythematous streaks on the volar surface of the left forearm, and several erythematous blotches about the neck and on the legs.

A patch test with Poison Ivy Extract (Wyeth) applied beneath the left breast showed definite vesiculation after 48 hours. A urinalysis and complete blood count were not remarkable.

Course: She was placed on 25 mg. of ascorbic acid three times a day, and given a drying lotion containing 2 per cent boric acid and 5 per cent tannic acid.

Six weeks later, she was seen again and stated that the dermatitis had cleared up within a week after her first visit, but that she had experienced two mild episodes of blisters afterwards. She stated that each episode had occurred after she had bathed her child, who had been playing in wooded areas.

In 1950, she took five injections of ivy extract at weekly intervals, commencing the first part of February, and took vitamin C fairly regularly. Her only trouble during the entire year consisted of a few vesicles about the wrists the latter part of June. At that time, she had not taken any vitamin C for two weeks, since her supply had become exhausted, and she had been so well that she neglected to get more.

Parenteral injections of **R. toxicodendron** apparently had helped this patient on several occasions in the past when the dermatitis had become chronic. The improvement which was noted at such times did not seem to be related to any local therapy used. A combination of vitamin C and extracts of **R. toxicodendron** given parenterally several weeks prior to the Rhus foliage season gave her almost complete freedom from vesicular dermatitis for the first year in 13.

It must be appreciated, of course, that such patients have a *"punctum minoris resistentiae,"* and that the poison ivy eruption may act to open the door to other sensitizations.

Renal Complications

I have never seen a patient with recognized renal complications from Rhus dermatitis. Rytand[4] has reported 7 cases in which renal complications appeared as the dermatitis was healing. In one patient fatal uremia with severe renal tubular degeneration developed. The nephrotic syndrome was prominent in 4 others. In 2 cases of probable streptococcic infection, the syndromes resembled the onset of glomerulonephritis.

Renal complications are explained on the basis: (1) that broken skin could serve as portals of entry for infection; (2) that the agent provoking the dermatitis is one which causes sensitization. The former theory could explain the development of glomerulonephritis, and the latter the occurrence of the nephrotic syndrome.

Systemic Complications

In cases of severe widespread involvement, there may be considerable loss of serum with resulting protein depletion. Such cases should be treated just as are severe burns, with careful attention directed towards maintaining the serum proteins.

Patients with severe extensive involvement or with heavy secondary infection may exhibit fever or even delirium. When secondary infection is suspected as being the offender, antibiotics as well as appropriate local therapy are indicated.

Therapeutic Complications

Dermatitis venenata from local therapy (therapeutic dermatitis)

Reactions from local therapy are not infrequent. Since a *punctum minoris resistentiae* exists, medicaments which under ordinary circumstances would be tolerated well by the skin may produce a treatment venenata. Consequently, local treatment should not be drastic. Wet dressings, and mild soothing lotions are about as far as one should go in treating an ordinary non-infected case of poison ivy dermatitis.

Dissemination of eruption from injection of Rhus extracts

On numerous occasions patients with a mild vesicular dermatitis have developed a generalized eruption after the injection of Rhus extracts during the acute eruptive phase of the disease. This eruption common-

ly takes the form of erythematous macules or papules, and may closely resemble an id reaction, commonly seen in a disseminated form secondary to macerated mycotic infections of the feet or crural regions or to an infected varicose ulcer of the ankle. Sometimes, the generalized eruption may be urticarial in nature. It may be accompanied by high fever and joint swelling.

Since injections of Rhus extracts offer nothing theoretically nor practically in treating the acute phase of poison ivy dermatitis, and whereas they may do a great deal of harm, it should be axiomatic never to inject Rhus extracts during the acute blistering phase of the disease.

Toxic psychosis from injections of Rhus extracts

This is an uncommon condition. I have seen but one such case, and this will be described below.

Case report

A 15 year old white farm girl was admitted to the hospital on June 11, 1949, on the fourth day of her illness. Five days previously, she had watched her father at work constructing a fish pond. On the following morning her face was edematous, and vesicles were present. She was given an injection of poison ivy extract that day and on the following by her physician. By the third day, there were numerous vesicles on the arms and legs, and she was given a third injection of poison ivy extract. Shortly after this injection, she became delirious and on the following morning was admitted to the hospital.

She had previously had "poison ivy" on three different occasions without complications. Three years previously she had been given six injections of poison ivy extract during the active phase of the disease without ill effect.

A review of her personality with her family showed no significantly abnormal traits except for rather marked shyness.

Physical examination: Oral temperature was 99.2 F. and pulse 82. The patient was completely disoriented. She was unable to answer any question intelligently. A marked degree of catatonia was present. Marked facial edema was present. Numerous vesicles and bullae were present on the face, arms, and legs. The remainder of the physical examination, including neurologic examination, was negative.

Routine examinations of the blood and urine were not remarkable significant.

Clinical course: She was started on intravenous infusions of 5 per cent dextrose in normal saline, along with 50 mg. of Benadryl by mouth every six hours. Dressings wet with ½ per cent solution of aluminum acetate were applied to the involved areas.

Within 24 hours the sensorium had returned to normal, and the catatonia had completely disappeared. This seemed to disprove the diagnosis of catatonic schizophrenia, which I had made the previous day.

On the second hospital day, she was started on collodial baths and a soothing drying lotion, and was discharged on the fourth hospital day, at which time her mental functions seemed normal, and the skin eruption was improving nicely.

Since that time, this patient has been seen at irregular intervals. Two months after discharge from the hospital, a patch test with Poison Ivy Extract (Wyeth) gave no reaction after 48 hours.

In June of 1950, she was seen again because of mild dermatitis venenata of the arms and legs. She was treated with aluminum acetate compresses, Benadryl, intravenous calcium gluconate, and later with a soothing drying lotion. The vesicles subsided completely within one week.

A patch test with Poison Ivy Extract (Wyeth) made during the latter episode showed slight vesiculation after 48 hours.

The patient has been seen several times, although not professionally, since June, 1950, and appears to be perfectly normal.

It would appear that this patient developed a severe toxic psychosis following the third injection of poison ivy extract. Two previous injections had seemed to aggravate the skin lesions. The mental symptoms appeared within an hour or two after the third injection, and led to a presumptive diagnosis of catatonic schizophrenia. The mental symptoms cleared up completely within a period of about 24 hours.

Summary and Conclusions

1. Poison ivy dermatitis may lead to complications in the skin and kidneys, as well as systemic symptoms. These complications are discussed in detail.

2. Treatment dermatitis venenata often complicates local therapy, particularly when such therapy is overly vigorous.

3. The use of poison ivy extracts during the active phase of Rhus dermatitis is condemned. This practice frequently aggravates and disseminates the existing eruption.

4. A clinical case of what we have termed "chronic Rhus eczema" is described.

5. A clinical description is given of a patient who developed a mental syndrome resembling catatonic schizophrenia, following the injections of Rhus extracts during the acute active phase of Rhus dermatitis.

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The general practitioner or family physician, because of his close association with the family, must occupy an important place not only in the prevention of tuberculosis but also in the treatment during what are ordinarily termed the pre- and post-sanitarium periods. — Edward W. Hayes, M.D., Calif. Med., December, 1950.

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"The prime object of the medical profession is to render service to humanity; reward or financial gain is a subordinate consideration. Whoever chooses this profession assumes the obligation to conduct himself in accord with its ideals."—Principles of Medical Ethics of the American Medical Association, Chapter 1, Section 1.

JANUARY, 1952

COMMISSION ON FINANCING OF HOSPITAL CARE

As our readers have learned from the papers, the American Hospital Association has established a Commission on Financing of Hospital Care "to make a two-year intensive study of the best means of providing high quality hospital care at the lowest possible cost to the public. . . The Commission is being created with full authority to report independently to the American public the results of its findings."

Funds for the study have been provided by a number of philanthropic agencies, and some private donations. The chairman of the National Commission is Dr. Gordon Gray, president of the University of North Carolina. The director is another North Carolinian, Mr. Graham Davis, who for 15 years was employed by the Hospital Section of the Duke Endowment, and who now is director of the hospital division of the W. K. Kellogg Foundation. Mr. Davis was granted a two-year leave of absence from the Kellogg Foundation.

That North Carolina should have had the honor of being chosen by the National Commission for the pilot study of hospitals was not solely because Gordon Gray and Graham Davis are both natives of the state. The Duke Endowment has for 26 years given financial aid to hospitals in the state, and as a result has accumulated statistics on these hospitals which will be of great value in the work of the Commission.

The objectives of the national study, as outlined in the prospectus presented by the American Hospital Association, are:

1. Evaluation of the current financial position of hospitals.
2. Determination of the need and demand for hospital services.
3. Analysis of the effect of medical practice on hospital costs.
4. Establishment of means of obtaining needed high quality hospital services at the lowest possible costs.
5. Evaluation of systems of payment for hospital care.
6. Investigation of methods for facilitating the most effective utilization of hospital resources.
7. The Commission will make recommendations for accomplishing changes which appear desirable as a result of this study.

When the announcement of the study was first made, the reaction of many was that it was simply another move to stimulate public demand for the federal government to take over both hospital and medical care. Those who attended the first meeting of the state committee, however, came away with the impression that, while there would be differences of opinion in the group, it was a representative body of North Carolina citizens and that every member seemed to be sincerely seeking to find the answers to the various problems facing the Commission. Certainly neither Gordon Gray nor Graham Davis can be accused of having socialistic backgrounds. It may be recalled that not long ago Mr. Davis made himself quite unpopular with American Legion leaders by opposing the reckless construction of Veterans Administration hospitals when the resources of private hospitals were available. Mr. Becker was chosen because of his record

in promoting voluntary hospital insurance in Michigan, and after he had been recommended by leading physicians of Michigan and by well known American Medical Association officials.

It is to be hoped that the doctors of North Carolina will justify the confidence placed in this state as a national leader in medical and hospital care by giving their full cooperation to both the state committee and the National Commission.

* * *

CONGRESSMAN DOUGHTON— THE DOCTOR'S FRIEND

The *Mooresville Tribune* for December 13 has a feature article telling of the defeat of a bill that, in the words of the *Tribune* writer, "would have put at the mercy of a gang of socialists in our Government every school of medicine, every school of dentistry, in America for the next five years," and "would have destroyed every 3-year school of nursing in America. Instead of the 3-year schools we would . . . have schools for the so-called 'super' nurses who would have probably have directed the work of the practical nurses."

The article relates that Dr. James W. Davis of Statesville got a copy of the bill after it had been passed unanimously by the Senate, just 24 hours before it was to go before the Rules Committee of the House. With Dr. L. B. Skeen and six nurses he caught a plane for Washington, where he explained to Congressman Robert L. Doughton the dangerous nature of the bill — which had been worded so insidiously that senators who were bitterly opposed to socialized medicine had voted for it. When the chairman of the Rules Committee, Percy Priest, tried to brush off the delegation by limiting the discussion to 40 minutes, Mr. Doughton protested so vigorously that they were allowed nearly three hours to present their arguments, which proved so convincing that the Rules Committee promptly killed the bill.

This story gives fresh evidence of the tremendous influence that Congressman Doughton has in Washington; and it also proves that he is a real friend of the doctors. The medical profession of North Carolina and of the nation owes a vote of thanks to Dr. Davis, for his vigilance—and to Congressman Doughton, for his very effective support.

It must not be assumed, however, that those who want to see the healing professions controlled by politicians have given up the fight. Bulletin No. 37 (Nov. 21, 1951) from the Washington office of the American Medical Association lists more than a score of bills calculated to give more or less political control to medical practice. Heading the list is Senator Murray's S. 337, "Authorizing funds to support medical, dental, osteopathy, nursing, public health, and hospital administration schools." Two separate bills "To provide a program of compulsory national health insurance" were introduced in the House (27, by Heller; 54, by Dingell).

"Eternal vigilance is the price of liberty."

* * *

WERE AMERICAN PRISONERS MURDERED?

The report recently released that more than 5000 American prisoners have been murdered by their Communist captors was the subject of comment by Mr. J. W. Clay in his syndicated column, "My Notions." Mr. Clay recalls that in every war atrocity tales are circulated by both sides. He says that if the story is true, it should have been published long ago, instead of being withheld until we are beginning peace talks. He personally has little faith in the story, and comments:

"Why should the enemy be so foolish as to murder American prisoners when living prisoners would be a trump card in their hands at the final peace table? Dead prisoners would have no bargaining value. The fact of their murder would be a liability rather than an asset. And the Communists are not dumb."

Mr. Clay's column calls to mind a little book written by Vilhjalmur Stefansson, the Arctic explorer, and published in 1927. In this book Mr. Stefansson told of a famous general who defended the invention and circulation of lies during World War I on the ground that "if you are justified in using shrapnel, poison gas, and torpedoes from submarines and bombs from airships, you are justified in using any means at all."[1]

This general was a good prophet, at least. In Mr. Stefansson's book—published in 1927, more than 14 years before Pearl Harbor—he was quoted as saying that he expected another war within 25 years from the last. When asked how he justified giving away his country's propaganda secrets, when similar propaganda would be needed in the next war, he replied that it would only be necessary to say, "We fooled you in the last war. But times have changed, and that sort of

thing would not work now. Besides, we would not fool you even if it served our ends, we have become so honorable." After this explanation, the same methods could be used, and even the same tales repeated.

The great majority of the American people would resent being considered as gullible as Mr. Stefansson's general assumed them to be. Certainly the parents of the American boys in Korea, whether prisoners or not, should not be made to suffer for the sake of rousing the fighting spirit of other Americans. It must be admitted, however, that the "Papa knows best" attitude of many of our government officials and military leaders is not calculated to increase public confidence in official statements.

Unquestionably there are times for "righteous indignation," but indignation that is truly righteous is apt to be spontaneous. It does not need to be stimulated by propaganda—especially propaganda that is not true.

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* * *

CIGARETTE SMOKING AND BLOOD FLOW

For some years it has been accepted that cigarette smoking caused a marked decrease in the blood flow of the skin. The accuracy of this view is sharply questioned by Dr. J. T. Shepherd in the *British Medical Journal* for October 27. Dr. Shepherd believes that the notable decrease in the blood flow reported by various observers has been obtained because the subjects tested smoked at a much more rapid rate than was normal.

In a series of experiments undertaken by him, each subject was asked how often he normally inhaled while smoking. "The usual reply was, 'Every 15 seconds,' and this rate was adopted in the preliminary series of experiments. However, generalized reactions . . . dizziness, nausea, and a feeling of faintness commonly followed inhalation at this rate." In 50 smokers who were surreptitiously observed it was found that the shortest time between inhalations was 43 seconds, the longest 68, and the average 66. After this, a series of subjects inhaling at intervals of one minute were tested, and it was found that there was no appreciable change in the level of the blood flow in their hands during and after smoking at this normal rate. A transient drop in blood flow was obtained after each deep inhalation, whether the cigarette was lit or not.

Dr. Shepherd reasons that the discrepancy between his results and those of previous observers may be due to a difference in the rate of smoking adopted. None of the previous observers timed the intervals between inhalations, but asked the subjects to smoke at their normal rate. Some of their subjects experienced vertigo, nausea, and other symptoms, whereas none of Shepherd's, inhaling at one minute intervals, had any unpleasant symptoms.

Whether or not one accepts Dr. Shepherd's conclusions, one must admire the astuteness of his observation concerning the effect of the rate of smoking on blood flow. Certainly it underscores the importance of being sure that observations are accurate before drawing conclusions from them.

* * *

VALUE OF HISTAMINE SKIN TESTS IN MENIERE'S DISEASE

Since Meniere in 1861 first described the syndrome that bears his name, various theories have been proposed concerning its etiology and treatment. Perhaps the most widely popularized conception regards it as allergic in origin. Atkinson[1] has led in ascribing it either to allergy or to vasospasm, and has popularized the use of histamine skin test as a means of distinguishing between the two mechanisms. He and his followers recommend treating the histamine-sensitive patients with desensitizing doses of histamine, the histamine negative (and presumably vasospastic) with nicotinic acid as a vasodilator.

Unfortunately for Dr. Atkinson's method, a British investigator[2] decided to test the validity of his histamine skin test. Fifty victims of Meniere's syndrome were tested by Atkinson's technique together with a corresponding number of controls. The number of positive reactions obtained was exactly the same in each group. The more often the tests were repeated in a subject, the greater the number of positive reactions obtained.

Again we see the importance of accurate test and control experiments before far-reaching conclusions are drawn.

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CORRESPONDENCE

TO the Editor:

As part of the civil defense communicable disease control program, all of the states have been asked to adopt a uniform list of reportable diseases.

The State Board of Health has revised the North Carolina list, effective January 1, 1952. The changes consist of adding several diseases of importance but of relatively low incidence so that the increased burden for most physicians will be negligible. To make the reporting of communicable diseases easier, the State Board of Health has also approved for use, beginning in 1952, a report card that combines the three existing separate communicable disease report cards.

Attached hereto is a revised list of these diseases showing a summary of the isolation and quarantine requirements. Several simplifications have been adopted in regard to the latter. If space is available, it would be very helpful to have this list printed in the JOURNAL.

The prompt reporting of communicable diseases is important at all times in the development and operation of efficient control programs. At this critical time, prompt reporting will help to keep civilian and military morbidity at a minimum and is essential also as a defense against biological warfare. For this latter reason, any unusual incidence of a communicable disease, whether the disease is on the reportable list or not, should be brought to the attention of the local health officer, who has been instructed to forward all information promptly.

J. W. R. Norton, M.D.
Secretary and State Health Officer
N. C. State Board of Health

* * *

NORTH CAROLINA STATE BOARD OF HEALTH
LIST OF REPORTABLE COMMUNICABLE DISEASES
(Revised through January 1, 1952)
(In addition to the diseases specified herein, cancer is also reportable)

Disease Required To Be Reported	*Placarding For Period of Isolation Or Quarantine*	*Isolation of Patient*	*Quarantine of Contacts*
*Anthrax	Required	Required until all lesions are healed	Required for 7 days from last exposure
†Botulism	Not Required	Not Required	Not Required
Chancroid	Optional with health officer	Optional with health officer	If suspected of being infected—optional with health officer
*Cholera	Required	Required until 3 stool cultures at 48-hour intervals are negative	Required for 5 days and until 3 stool cultures at 48-hour intervals are negative
Dengue	Not Required	Required to be screened until 6th day	Not Required
*Diphtheria	Required	Required until 2 cultures at 24-hour intervals are negative or for 21 days	Required for susceptible contacts for 7 days from last exposure
*Dysentery, Amebic	Not Required	Not Required	Not Required
*Dysentery, Bacillary	Not Required	Required until 2 stool cultures at 5-day intervals are negative or for duration of disease	Not Required
Encephalitis	Not Required	Required to be screened for duration of fever	Not Required
Glanders	Required	Required until all lesions are healed	Required for 14 days from last exposure
*Gonorrhea	Optional with health officer	Optional with health officer	If suspected of being infected—optional with health officer
Granuloma Inguinale	Optional with health officer	Optional with health officer	If suspected of being infected—optional with health officer
†Hepatitis	Not Required	Optional with health officer	Not Required
Leprosy	Required	Required until all lesions are healed	Required until examined for lesions
†*Leptospirosis	Not Required	Not Required	Not Required
Lymphogranuloma Venereum	Optional with health officer	Optional with health officer	If suspected of being infected—optional with health officer
*Malaria	Not Required	Required to be screened for duration of fever	Not Required
Measles	Not Required	Required for 7 days after rash appears	Not Required

*Diagnostic laboratory service is available for these diseases from the State Laboratory of Hygiene.
†To be reported effective January 1, 1952.

Disease Required To Be Reported	*Placarding For Period of Isolation Or Quarantine*	*Isolation of Patient*	*Quarantine of Contacts*
*Meningococcus Infection	Required	Required for 14 days	Required for 14 days from last exposure or until prophylactic treatment has been given, unless released by health officer
*Paratyphoid Fever	Required	Required until 2 stool cultures at 5-day intervals are negative	Not Required
Plague	Required	Required for duration of the disease	Required for 14 days from last exposure
Poliomyelitis	Required	Required for 7 days	Required for contacts under 16 years for 7 days from last exposure
Psittacosis	Required	Required for duration of the disease	Required for 14 days from last exposure
†*Q Fever	Not Required	Not Required	Not Required
*Rabies	Not Required	Required for duration of the disease	Not Required
*Rocky Mountain Spotted Fever	Not Required	Not Required	Not Required
Scarlet Fever	Required	Required until adequately treated or for 14 days and until discharges have ceased	Required for susceptible contacts under 16 years for 7 days from last exposure or until prophylactic treatment has been given
Septic Sore Throat	Required	Required for duration of the disease	Required for contacts under 16 years for 7 days from last exposure
Smallpox	Required	Required until all lesions are healed	Required for all contacts until vaccinated or revaccinated
†Staphylococcus Food Poisoning	Not Required	Not Required	Not Required
*Syphilis	Optional with health officer	Optional with health officer	If suspected of being infected—optional with health officer
†Tetanus	Not Required	Not Required	Not Required
Trachoma	Optional with health officer	Optional with health officer	Not Required
†*Trichinosis	Not Required	Not Required	Not Required
*Tuberculosis	Optional with health officer	Optional with health officer	If suspected of being infected—optional with health officer
*Tularemia	Not Required	Not Required	Not Required
*Typhoid Fever	Required	Required until 2 stool cultures at 5-day intervals are negative	Not Required
*Typhus Fever, Endemic	Not Required	Not Required	Not Required
*Typhus Fever, European	Required	Required until 2 days after fever subsides	Required for 14 days from last exposure
*Undulant Fever	Not Required	Not Required	Not Required
Whooping Cough	Required	Required for 21 days after onset of cough	Required for susceptible contacts for 14 days from last exposure
Yellow Fever	Not Required	Required to be screened until 6th day	Not Required

Instructions for Reporting

1. Physicians and other persons are required to report these diseases as follows:
   A. In case one or more physicians are in attendance, the first physician to determine the nature of the infection is responsible for reporting.
   B. In case no physicians are in attendance, school superintendents or teachers, parents, guardians, or heads of households, nurses, owners of dairies or other food-handling establishments, and superintendents of public and private institutions, hospitals, or jails are responsible for reporting cases of these diseases in persons coming under their supervision.
2. All reports of these diseases from persons required to report should be mailed within 24 hours after diagnosis to the health officer of the county or city in which the case is located at the time of the report.
3. When the local health officer receives reports of cases that were located within his jurisdiction at the time of report and that were also located either within his jurisdiction or at some point outside North Carolina at the time of onset of the disease, he should forward such reports within 24 hours directly to the Division of Epidemiology, State Board of Health, Raleigh, N. C.
4. When the local health officer receives reports of cases that were located within his jurisdiction at the time of the report but that were located in another county or city in North Carolina at the time of onset of the disease, he should forward such reports within 24 hours directly to the local health officer of the county or city in which the case was located at the time of onset. A copy of such reports, marked "copy," should be mailed to the State Board of Health at the same time. Reports of the venereal diseases should be forwarded by the local health officer directly to the State Board of Health regardless of place of onset.**
5. The local health officer should forward to the State Board of Health within 24 hours all reports received from other health officers.

*Diagnostic laboratory service is available for these diseases from the State Laboratory of Hygiene.

**Reports of all diseases, except venereal diseases, are recorded by the Division of Epidemiology by place of residence. The venereal diseases are recorded by place of report.

†To be reported effective January 1, 1952.

BULLETIN BOARD

Watts Hospital Medical and Surgical Symposium

The ninth annual Watts Hospital Medical and Surgical Symposium will be held at the Carolina Theater in Durham, February 13 and 14. The following program has been arranged:

Wednesday, February 13

10:45 a.m.

Address of Welcome—Sample B. Forbus, Director of Watts Hospital

Clinicopathological Conference — Shields Warren, M.D., Professor of Pathology, Harvard Medical School; George Van S. Smith, M.D., Professor and Head of the Department of Gynecology, Harvard Medical School; and Hugh F. Hare, M.D., Radiologist, Lahey Clinic, Boston

2 p.m.

Choice of Anesthetic Agents in Certain High Risk Patients — Albert Faulconer, Jr., M.D., Mayo Clinic, Rochester, Minnesota

3 p.m.

Breast Cancer Complicated Pregnancy — Frank E. Adair, M.D., Attending Surgeon and Executive Officer, Memorial Hospital, Associate City Professor of Surgery, Cornell University Medical School, New York

4:15 p.m.

The Acute Radiation Syndrome and its Therapy—Shields Warren, M.D.

8 p.m.

Panel Discussion on Endocrinology—Edwin C. Hamblen, M.D., Professor of Endocrinology, Duke University Medical School, Durham, Moderator

The Classification of Metabolic Bone Disease in Terms of Pathologic Physiology — Edward C. Reifenstein, Jr., M.D., Oklahoma Medical Research Institute and Hospital, Oklahoma City

The Male Climacteric—E. Perry McCullagh, M.D., Head of the Section on Endocrinology and Metabolism, Cleveland Clinic, Cleveland, Ohio

Endocrine Factors Involved in the Production of Benign Lesions of the Breast — Nathan A. Womack, M.D., Professor of Surgery, University of North Carolina Medical School

The Use of Hormones in Cases of Advanced Breast Cancer—Frank E. Adair, M.D.

Progesterone Metabolites in Pregnancy — George Van S. Smith, M.D., Harvard Medical School

Thursday, February 14

10 a.m.

Recent Advances in the Recognition and Management of Renal Insufficiency—Charles H. Burnett, M.D., Professor of Medicine, University of North Carolina Medical School

11 a.m.

The Treatment of Osteoporosis, the Bone Disease of Aging Persons, With Steroid Hormones—Edward C. Reifenstein, Jr., M.D.

12:15 p.m.

Clinical Application of Endocrine Therapy in Menstrual Irregularities—George Van S. Smith, M.D.

2 p.m.

A Concept for the Extension of Surgery in the Treatment of Malignancy, Nathan A. Womack, M.D.

3 p.m.

The Clinical Value of Testosterone—E. Perry McCullagh, M.D.

4:15 p.m.

Cancer of the Thyroid—Hugh F. Hare, M.D.

American College of Physicians
Regional Meeting

The 1951 regional meeting of the American College of Physicians was held at Duke University School of Medicine on December 6. Participating in the program were Drs. MacDonald Dick, George S. Sutherland, Philip Handler, Eugene A. Stead, Jr., George Margolis, and John B. Hickam, all of Durham; Dr. Richard L. Lyman of Nashville, Tennessee; Dr. Paul F. Whitaker of Kinston; Drs. Robert L. McMillan and George T. Harrell of Winston-Salem; Dr. S. M. Bittinger of Oteen, and Dr. Charles H. Burnett of Chapel Hill. Speaker of the Day was Dr. Cyrus C. Sturgis, regent, American College of Physicians and professor and chairman of the Department of Internal Medicine, University of Michigan Medical School, Ann Arbor. Dr. Elbert L. Persons is governor of the college for North Carolina.

News Notes from the University of North Carolina School of Medicine

Dr. P. A. Owren, professor of medicine at the University of Oslo, Norway, gave a lecture on "Physiology of Blood Clotting and Hemorrhagic Diseases" to the faculty and student body on January 25.

* * *

Dr. George D. Penick, instructor in pathology, described his studies on "Impaired Coagulation Following Total Body Irradiation" to the Southeastern Section of the Society of Experimental Biology and Medicine in Atlanta on January 17.

* * *

Dr. Charles H. Burnett, professor of medicine, discussed "Management of Diabetes" before the Forsyth County Medical Society on January 8.

* * *

Research grants for the present year include: Department of Physiology—$13,250 to Dr. John H. Ferguson from the U. S. Public Health Service to continue a blood coagulation research project; $6,000 to Dr. A. T. Miller from the U. S. Public Health Service to continue a study of influence of obesity on response to stress; $5,500 to Dr. E. P. Hiatt from the National Heart Institute for a continuation of a study investigating action of alkaloids on the cardiovascular system. Department of Pathology—$18,000 to Dr. K. M. Brinkhous from the National Blood Program for studies on antihemophilic factor and platelets; $15,900 to Dr. K. M. Brinkhous from the U. S. Public Health Service for studies on blood coagulation and antihemophilic activity of plasma; $5,000 from the U. S. Public Health Service in support of a cancer teaching program to improve the teaching of pathology of neoplasms to medical students. Department of Pharmacology — $5,000 to Dr. Thomas C. Butler from the U. S. Public Health Service for an investigation of the metabolic fate of certain N-substituted derivatives of barbituric acid and hydantoin used in the treatment of epilepsy; $5,900 to Dr. T. Z. Csaky from the U. S. Public Health Service for a study of the metabolism and the physiological utilization and actions of methyl ethers of monosaccharides. Department of Biological Chemistry — $4,500 from the Atomic Energy Commission to Dr. James C. Andrews and M. K. Berkut for an investigation of the influence of fluorides on the calcification mechanism in bone and tooth structure; $3,500 to Drs. J. Logan and Elinor M. Irvin from The Research Corporation for

a project entitled "The isolation and physicochemical characterization of nucleic acids and nucleoproteins; their interactions with acridine and quinoline derivatives." Department of Anatomy—$4,000 to Dr. C. W. Hooker from the Jane Coffin Childs Memorial Fund for Medical Research to continue a study of "Testicular tumors in mice and the problem of the nature of the tumor cell"; $15,545 from the U. S. Atomic Energy Commission to Dr. C. D. Van Cleave and Dr. C. T. Kaylor for the continuation of their radioautographic study of the localization of radioberyllium in the tissues of the rat.

Forsyth County Medical Society

The Forsyth County Medical Society held a dinner meeting at the Robert E. Lee Hotel on December 11. Dr. Eben Alexander of Winston-Salem spoke on "The Diagnosis and Treatment of Intracranial Aneurysms."

Cartaret County Medical Society

The Carteret County Medical Society held its regular monthly meeting at the Morehead City Hospital Monday night, December the 10th, Dr. C. S. Maxwell, president, presiding.

This was the time for the election of officers for the coming year. Dr. M. B. Morey, Morehead City, was elected president, and Dr. Luther Fulcher, Beaufort, was elected secretary-treasurer. Dr. N. Thomas Ennett, county health officer, continues as corresponding secretary. Dr. B. F. Royal was elected to the House of Delegates of the State Medical Society, with Dr. K. P. B. Bonner alternate.

Dr. S. W. Thompson presented the matter of the local society inviting the Seaboard Medical Society (composed of physicians in Virginia, North Carolina, and South Carolina) to hold its next annual meeting, in November, 1952, in Morehead City. Dr. Thompson explained that Dr. James Graham Ramsey of Washington, North Carolina, had recently been elected president of the Seaboard Society and that it was customary for the meeting of the society to be held in the home town of the president; but as Washington did not have sufficient hotel facilities, the officers of the Seaboard Society desired very much to hold the meeting in Morehead City. The Carteret County Society unanimously approved the motion that the Seaboard Society be invited to Morehead City.

The matter of permanent arrangements for x-ray and fluoroscopic work for the Morehead City Hospital was discussed, final decision to await the next meeting of the society.

Visitors were Dr. A. L. Daughtridge of Rocky Mount, and Dr. James H. R. Booth, Elizabeth City.

N. THOMAS ENNETT, M.D.
Corresponding Secretary

North Carolina Alcoholic Rehabilitation Program

A family guide on alcoholism, written and published by the North Carolina Alcoholic Rehabilitation Program, is now ready for statewide distribution, it was announced recently by S. K. Proctor, executive director of the ARP.

As part of the ARP educational services, the guide can be secured by writing the North Carolina Alcoholic Rehabilitation Program, Box 9118, Raleigh, North Carolina.

National Society for Crippled Children and Adults

For the first time in its 30-year history, the National Society for Crippled Children and Adults, the Easter Seal Society, will hold its annual convention on the West Coast in 1952, it has been announced by Lawrence J. Linck, executive director. The convention will be held in San Francisco, October 25 through 30.

(BULLETIN BOARD CONTINUED ON PAGE 52)

Pontocaine Spinal Anesthesia Prolonged by Fifty Per Cent

Prolongation of Pontocaine spinal anesthesia by approximately 50 per cent through the addition of the vasoconstrictors Neo-Synephrine or epinephrine is reported by Drs. John J. Bonica, Philip H. Backup and W. Howard Pratt of the Tacoma General Hospital in **Anesthesiology** (12:431, 1951).

Pontocaine itself, they point out, gives comparatively long-lasting spinal anesthesia which can be intensified by the vasoconstrictors. The paper is based on a controlled study, in which 631 nerve blocks were administered to 487 patients, both for therapeutic purposes and for a wide variety of surgical procedures.

New B Complex Preparation Introduced By Winthrop-Stearns

Winthrop-Stearns, Inc., has introduced a new injectable vitamin B complex preparation called Betasynplex with Vitamin B_{12} found highly effective for multiple vitamin therapy in cases of deficiency of B complex factors. The preparation has proved especially useful for patients who fail to respond to oral administration.

In addition to vitamin B the product contains five important factors of vitamin B complex which have been synthesized: thiamine, riboflavin, nicotinamide, calcium pantothenate, and pyridoxine. Vitamin B_{12}, a highly potent constituent of liver extract, is the liver's principal anti-pernicious anemia factor, and is most effective by injection. It stimulates the production and maturation of red blood cells in the bone marrow.

Betasynplex comes in a stable, instantly soluble Niphanoid form in single dose ampuls and multiple (10 dose) vials. Manner of use is to add 2 cc. of sterile distilled water to a single dose ampul, or 20 to 30 cc. to a 10 dose vial. The solution which forms almost immediately is injected either intramuscularly or intravenously.

Winthrop-Stearns Introduces Two Heavy Pontocaine Solutions

Winthrop-Stearns Inc., pharmaceutical manufacturer, has announced introduction of two new forms of a heavy solution of Pontocaine Hydrochloride for spinal anesthesia. They consist of a 5 cc. ampul containing 0.3% Pontocaine Hydrochloride in 6 per cent dextrose solution and a 2 cc. ampul containing 0.2 per cent Pontocaine Hydrochloride in 6% dextrose solution. They come packed in boxes of tens.

A heavy solution of Pontocaine Hydrochloride in dextrose is widely used to produce prolonged anesthesia for various types of major operations. It has also proved particularly suitable for use in obstetrics to produce anesthesia during delivery.

BOOK REVIEWS

Antibiotic Therapy. By Henry Welch, Ph.D., and Charles N. Lewis, M.D. 566 pages. Price, $10.00. Washington, D. C.: The Arundel Press, 1951.

During the past ten years, the literature dealing with the antibiotic drugs has been voluminous and widely dispersed in American and foreign periodicals. In a number of instances, a critical appraisal of the material has been difficult for the reader without special technical knowledge. A concise, well organized, well indexed, and up-to-date summary of much of this information (through 1950) is presented in the new book **Antibiotic Therapy.** The authors, as members of the Antibiotic Division of the Food and Drug Administration, have been responsible for the analysis of data concerning all antibiotic preparations prior to governmental certification and commercial distribution. In this unique position, they are well qualified to bring together and evaluate the mass of information on the antibiotic drugs now in use.

The book is divided into two major portions. The first section consists of a brief review of the development of important antibiotics, their pharmacologic properties, their antimicrobial spectra, and a description of the numerous dosage forms now available. The second section of the book presents clinical experience in the use of the antibiotic drugs by diseases. A representative bibliography is appended to each chapter.

The section on the pharmacology of the antibiotic agents is particularly well presented, and contains much valuable and readily accessible information. The clinical section stresses the result of specific treatment; it is hoped that the reader will not be anesthetized by this emphasis and overlook the importance of supportive measures in the therapy of the infectious diseases.

In the words of Dr. Chester S. Keefer, "It is a pleasure to commend to the reading medical public **Antibiotic Therapy** by Henry Welch and Charles Lewis."

An Atlas of Normal Radiographic Anatomy. By Isoadore Meschan, M.D. 593 pages. Price, $15.000. Philadelphia: W. B. Saunders Company, 1951.

This publication, in one volume, is unique in being one of the few published works which correlate the normal anatomy, the actual radiograph, and the positioning of the patient. The different systems of the body are discussed systematically, and the information correlated with clarity.

The author uses a direct, clear, conversational style, which, in the reviewer's opinion, is much more to be desired than the dry cataloguing of descriptive data. This work is not only readable, but so organized that the information is easily found. The material includes all structures. The illustrative material is generous in amount, excellent in quality, and apt in selection.

This work should be in the library of all radiologists. Its use, however, is not limited to radiologists, for general practitioners or any other physician making roentgen studies will find it a reliable source of information for daily reference.

Allergy in Relation to Pediatrics. Edited by Bret Ratner, M.D. 240 pages. Price, $3.75. Saint Paul, Minnesota: Bruce Publishing Company, 1951.

This excellent group of articles written by the leading pediatric allergists of the country represents a panel discussion held under the auspices of the American College of Allergists, and is an official publication of that group. Though all fields of pediatric allergy are covered, with basic chapters on the genesis of allergy, the bulk of the book is on the practical problems of allergic children as encountered in a doctor's practice.

There has been no attempt to go into great detail regarding the technical procedures involved in the preparation of antigens and the like, but this in no way detracts from the usefulness of the book. Most of the chapters are well written, by authors whose names constitute the genuine seal of authority. This reviewer has long felt the need for a book such as this, which could be recommended to physicians as an aid in their everyday problems. It is full of practical information, and its conversational tone makes it easy to read. It can be recommended unhesitatingly for wide distribution among pediatricians, general practitioners, and students.

Psychosomatic Gynecology: Including Problems of Obstetrical Care. By William S. Kroger, Assistant Clinical Professor of Obstetrics and Gynecology, Chicago Medical School; Attending Obstetrician and Gynecologist, Edgewater Hospital, Chicago; and S. Charles Freed, M.D., Adjunct in Medicine, Mount Zion Hospital, San Francisco, California. 487 pages. Price, $8.00. Philadelphia and London: W. B. Saunders Company, 1951.

In this book the authors attempt to present the psychodynamics of certain problems occurring in gynecology and obstetrics. Their stated purpose is to provide a workable knowledge of the psychodynamics of disease for the physicians specializing in obstetrics and gynecology. Briefly, the psychodynamic patterns, as presented in the book, are fundamentally those of Freud. The first portion of the book deals with the psychosomatic aspects of the fetus and infant. In this section the effects of the prenatal care, as well as the care of the mother during labor and delivery and during the puerperal period, are considered from the viewpoint of the ultimate effect on the child. This is followed by a discussion of psychosexual development of the infant, in which the original Freudian theories are outlined.

The second part deals with the psychosomatic aspects of the mother during pregnancy, and hinges largely upon the work of Grantly Dick Read, and the use of hypnosis during labor. It covers, in addition, nausea and vomiting, ptyalism, abnormal appetite, lactation, pseudocyesis, dysmenorrhea, premenstrual tension, and so forth.

In part four, some of the more common gynecologic psychosomatic problems are discussed, including contraception, sterility, frigidity, dyspareunia, low back pain, pelvic pain, menopause, pruritus, and the congestion fibrosis syndrome. The book concludes with a section on methods of diagnosis and treatment.

One of the best features of the book is the excellent and well placed bibliography, which makes it possible to check references readily. Unfortunately, the book falls far short of its original aim. The average practitioner of obstetrics and gynecology certainly will not be sympathetic with the psychodynamic explanations given. For instance, in

a chapter devoted to preeclampsia and eclampsia it is suggested that the etiology may well be psychosomatic. Another chapter is entitled "Emotional Spontaneous Abortion." The extreme is reached in the discussion of cystocele, stress incontinence and fibroids, in which it is suggested that these too may be of psychic origin. Single case histories are used as proof of the author's contentions—a technique which makes reading enjoyable but unscientific. The cases are invariably of a bizarre nature.

Strangely enough, there is no discussion of postpartum depression, which is a fairly common disorder. Similarly, the influence of organic disease on the patient's psyche is not given its due importance. A recent editorial in the **New England Journal of Medicine** (November 15, 1951) entitled "Stark Unreality" hits the nail pretty well on the head when it states: "The movement is far enough out of critical hands to permit the gullible, unknowing public to believe that it can worry itself into heart disease, hypertension, and thyrotoxicosis—in addition to peptic ulcer—or, shortly, if divinations go on apace, into almost any disease that has previously been classified as predominantly of organic or exogenous origin. Although popular and semiscientific journalism are inculpated, the too enthusiastic and uncritical psychosomaticists themselves are primarily responsible."

The authors freely admit that much of the material in the book will be controversial. It would seem better to use the words "highly speculative."

The Specialties in General Practice. Edited by Russell L. Cecil, M.D., Professor of Clinical Medicine, Cornell University Medical College, New York City. 818 pages. Price, $14.50. Philadelphia and London: W. B. Saunders Company, 1951.

Another tribute to the importance of the family doctor is this volume written by 14 specialists especially for general practitioners. That it was brought out under the capable editorship of Dr. Russell L. Cecil assures it a place in medical literature. The subjects discussed are minor surgery, orthopedic surgery, fractures and dislocations, urology, diseases of the anus, rectum and colon, gynecology, obstetrics, pediatrics, ophthalmology, diseases of the nose and throat, diseases of the larynx, bronchi and esophagus, otology, dermatology and syphilology, and psychiatry.

In such a work as this it is difficult to secure proper balance, and the length of some of the sections is not a measure of their importance. For example, gynecology is allotted only 21 pages, orthopedic surgery with fractures and dislocations, 115 pages. Barely more than half a page is devoted to the important subject of the menopause and its treatment.

There are many physicians who would not agree with the statement that identical preparations are required for a proctoscopic and for an x-ray examination of the colon, but who would concur in the opinion of Bockus that special preparation for a proctoscopic examination is seldom necessary. The excellent discussion of habitual constipation, however, leaves no room for argument.

The chapters on dermatology and syphilology, and on psychiatry are particularly good, though colored plates would have made some of the skin lesions appear to better advantage. The section on interviewing and on the management of the neurotic patient should be most helpful.

The book can be heartily recommended to the general practitioner as well worth buying and keeping close at hand, to be referred to frequently.

De Re Medica. 643 pages. Published by Eli Lilly and Company for distribution to doctors, 1951.

As stated in the dedication to the medical profession, this book "emulates the purpose and title of the original classic work of Celsus, . . . first published in Florence in 1748." It lives up to its avowed purpose of presenting "therapeutic suggestions in common diseases."

The first 280 pages are devoted to "Common Diseases: Suggested Treatment." In the next 236 pages, "Drugs—Actions and Uses"—are discussed. Section 3 comprises forty-five excellent colored plates showing anatomic dissections, various skin lesions, the blood, flocculation tests for syphilis, pertussis agglutination test, gastric analysis, and urine test charts. Sections 4, 5, and 6 are devoted to laboratory tests, poisons and their antidotes, and useful tables. Only thirty-six pages—a comparatively modest proportion of the entire book — in Section 7 is a selected list of Lilly products. The final section is a seventeen page index.

The book may be had from Eli Lilly and Company, Indianapolis, by any doctor for the asking, or from one of the detail men representing that company. Since so much territory is covered, much of the discussion is necessarily sketchy, and it should not be accepted as the equivalent of a standard practice of medicine text. The description of pancreatitis, for example, gives only the comparatively rare suppurative or gangrenous form, and omits the far more common and less serious pancreatic edema.

For the most part, however, the information appears to be accurate and certainly is readily accessible. The book is well worth keeping at hand for quick reference.

Diodrast Aids Surgeons in Diagnosing Brain Tumors

An effective technique in the diagnosis of brain tumors, intracranial aneurysms and cerebral vascular accidents, involving use of the radiopaque compound Diodrast, is described by Dr. Sidney W. Gross, Mt. Sinai Hospital, New York, in charts prepared for exhibition at medical society meetings.

The technique, which is now being widely employed in neurosurgical clinics whenever such tumors are suspected, was described in detail at the recent meeting of the American Medical Association.

When Diodrast is injected into the common carotid artery, the blood vessels in the head, supplied by this artery, are made visible in x-rays. Brain tumors change the normal pattern of the blood vessels.

Citing the advantages of this method over ventriculography, Dr. Gross said that the tumor is often directly visualized by "staining" with Diodrast, or by the outline of its vascular pattern. Frequently, he added, even the nature of the tumor may be predicted from the character of its vascular pattern.

JOURNALS WANTED

The publishers of the NORTH CAROLINA MEDICAL JOURNAL are in need of additional copies of the JOURNAL for July, 1951. Thirty cents will be paid for each copy of this issue which is received in good condition at Carmichael Printing Company, 118 West Third Street, Winston-Salem 1, North Carolina.

BULLETIN BOARD

(CONTINUED FROM PAGE 49)

FEDERAL SECURITY AGENCY

Public Health Service

Nine laboratory refresher courses covering the serology of syphilis, the **Treponema pallidum** immobilization test, and the laboratory diagnosis of venereal disease to be conducted at the Venereal Disease Research Laboratory in Chamblee, Georgia, during 1952, were announced recently by Dr. Theodore J. Bauer, chief of the Public Health Service's Division of Venereal Disease.

The courses start in January and are open to senior technicians and to laboratory directors throughout the United States and the Territories who are presently employed in the field.

Applications for these courses must be approved by the state health officer or state laboratory director of the region from which they are sent and should be addressed to: Director, Venereal Disease Research Laboratory, Division of Venereal Disease, Box 185, Chamblee, Georgia.

* * *

Dr. Leonard A. Scheele, Surgeon General of the Public Health Service, Federal Security Agency, has called to the attention of United States bird owners and pet shop operators newly adopted changes in Federal quarantine restrictions on interstate shipments and foreign importations of parrots, parakeets, love birds, and other members of the psittacine bird family.

Changes in the quarantine regulations covering importations of the birds from abroad became effective December 15, with their publication in the Federal Register, Dr. Scheele said.

Changes in the regulations governing interstate shipments went into effect on November 15 and appear in the Federal Register of that date.

Dr. Scheele explained that the quarantine restrictions were imposed originally because psittacine birds are known carriers of psittacosis, or "parrot fever," an acute respiratory disease of varying severity which is readily transmittable to humans.

Changes in the Foreign Quarantine Regulations include (1) removal of the eight-month minimum age limit on birds imported for use by zoos and research institutions; (2) a reduction from two years to four months in the time birds imported as pets must be in the owner's possession prior to entry into this country; (3) removal of the requirement that imported pet birds must be transported to the owner's residence immediately upon arrival in this country; and (4) the addition of a requirement of an affidavit that birds imported as pets are not to be resold and that no other birds have been brought into the country as pets by the owner in the preceding year.

Changes in the Interstate Quarantine Regulations (1) remove all Federal restrictions on shipments of psittacine birds from psittacosis-free areas in the United States; and (2) now prohibit the shipment of the birds from areas where the Surgeon General has determined that psittacosis infection is dangerous to the public health.

Dr. Scheele said none of the changes affects the standing requirement that interstate shipments of psittacine birds must be covered by a permit when it is required by the health department of the State of destination.

Dr. Scheele said the changes in the quarantine regulations followed a Public Health Service study of the nation's psittacosis problem. Among other findings, the study disclosed that psittacosis is no longer a major public health problem in this country and that it is found among birds other than members of the psittacine family.

Pet psittacine birds in the United States usually include parrots, Amazons, Mexican double heads, parakeets, African grays, cockatoos, love birds, lories, and lorikeets.

DEPARTMENT OF THE ARMY

Dr. Francis G. Blake, wartime adviser to the President on problems of epidemic disease and former dean of the Yale Medical School, has been named civilian Technical Director of Medical Research in the Office of the Army Surgeon General, the Department of the Army announced recently. He assumed his new duties January 2.

VETERANS ADMINISTRATION

Dr. Derrick T. Vail, professor and chairman of the Department of Ophthalmology at Northwestern University, will become chairman of the Special Medical Advisory Group of the Veterans Administration in January, 1952, VA announced.

Dr. Vail will succeed Dr. Charles W. Mayo of the Mayo Clinic at Rochester, Minnesota, who has been chairman of the group since it was organized six years ago. Dr. Mayo will continue as a member.

Other new officers of the group are Dr. Franklin D. Murphy, chancellor of the University of Kansas, vice chairman, and Dr. Brian B. Blades, professor of surgery at George Washington University, secretary.

Dr. Vail, in addition to being professor and chairman of the Department of Ophthalmology at Northwestern University, is editor of the American Journal of Ophthalmology.

Institute Heads Cited by N.Y.A.S.

The New York Academy of Sciences, fourth oldest scientific society in the United States, has elected Dr. Maurice L. Tainter, director of Sterling-Winthrop Research Institute, as a Councilor for 1952-54. The Academy has also elected Dr. C. M. Suter, associate director of the research institute, to fellowship.

The New York Academy of Sciences was organized in 1817, and its present membership is located in all 48 states as well as in 40 foreign countries.

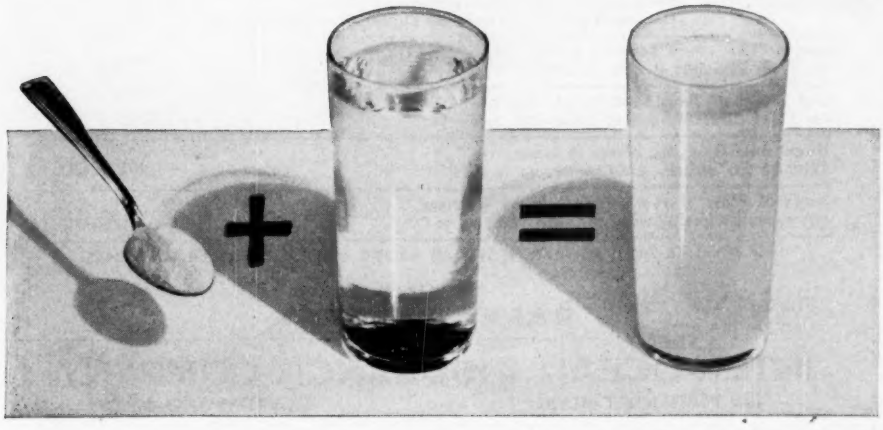
Warning to Drinkers

A recent study by Dr. Theron Randolph, one of several eminent specialists speaking at the current congress of the International Association of Allergists in Zurich, Switzerland, embodies for both the confirmed drinker and the "one-or-two-snifters" man this warning:

Don't drink beer if you are allergic to barley; don't drink wine if you are allergic to grapes; don't, in fact, drink anything if you are allergic to the grain, fruit or cereal from which it derives. To do so, says Dr. Randolph, will be to precipitate promptly and in intensive form the old allergy symptoms. Moreover, the physician continues, if such drinking continues, the imbiber will suffer two different but coalescing hangovers—the usual one from alcohol itself, and a second from the allergy involved.

Microfilmed copies of the NORTH CAROLINA MEDICAL JOURNAL are available and may be ordered from University Microfilms, 312 North First Street, Ann Arbor, Michigan.

Normohydration
FOR BOWEL REGULATION



Typically, the constipated stool is dehydrated, whereas the diarrheal stool or that induced by salines and irritants is hyperhydrated, containing free water.

When Metamucil is employed for the management of constipation, it is mixed in a full glass of cool liquid. The ingested liquid containing the mucilloid promotes normohydration.

METAMUCIL® is the highly refined mucilloid of Plantago ovata (50%), a seed of the psyllium group, combined with dextrose (50%) as a dispersing agent. G. D. Searle & Co., Chicago 80, Illinois.

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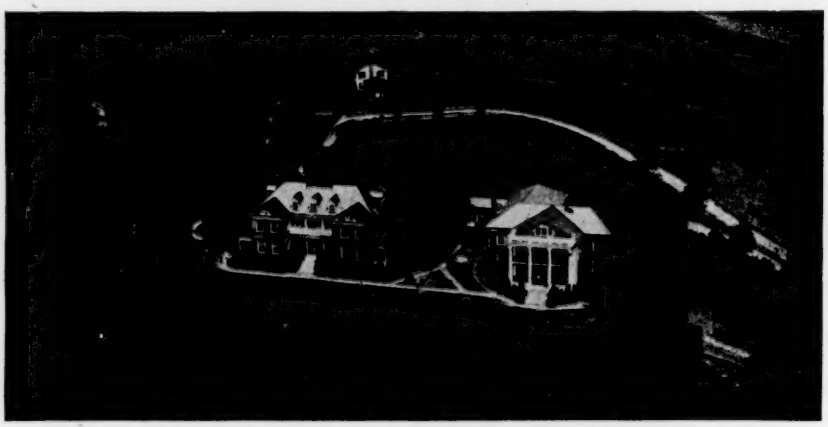

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1. Perloff, Wm. H. (1951), Treatment of the Menopause. II. American J. Obst. & Gynec., 61:670, March.

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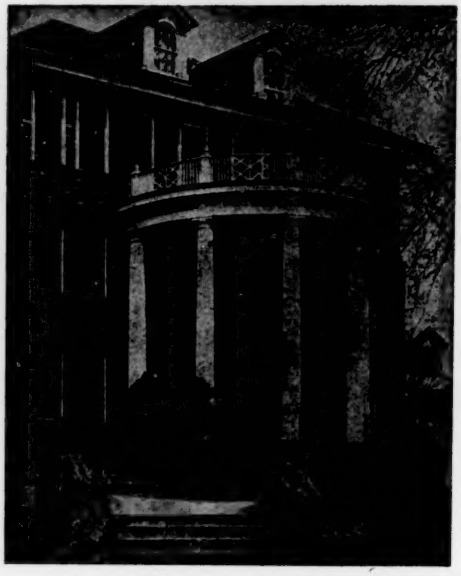

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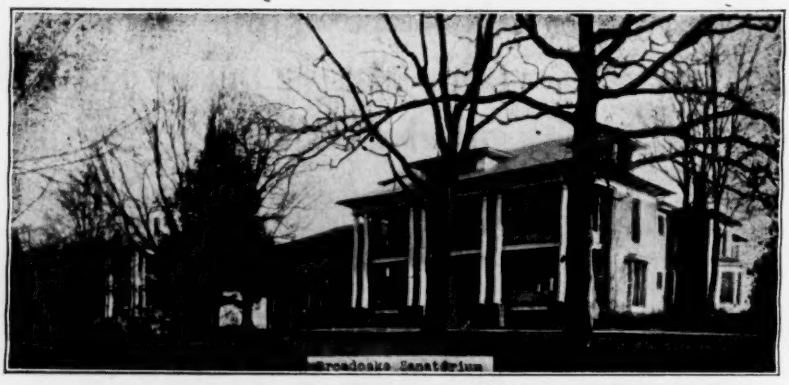

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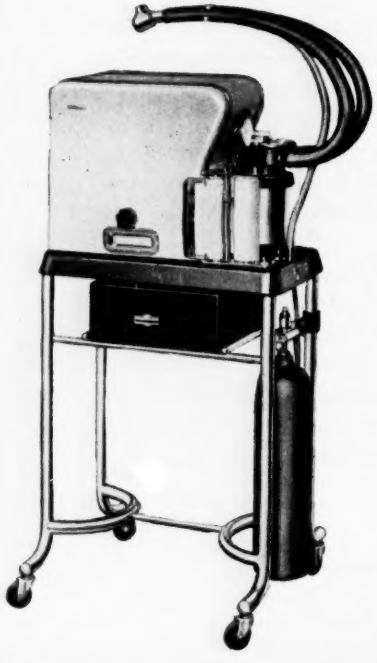

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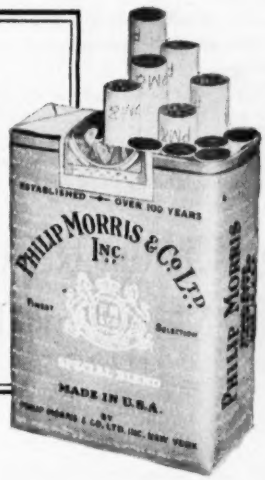

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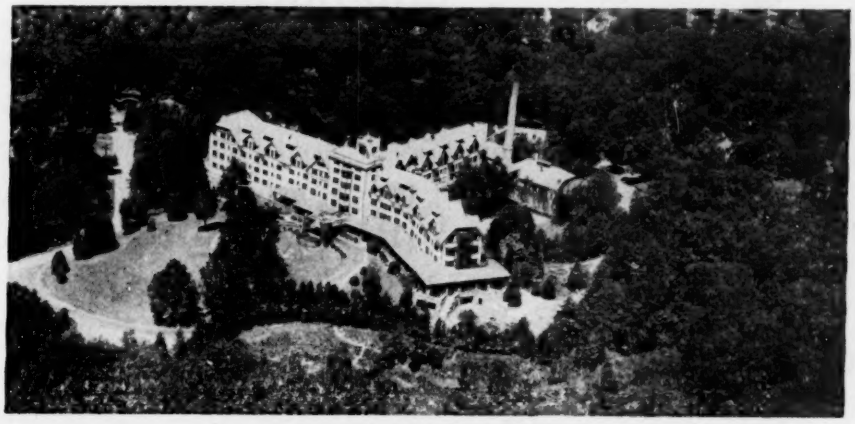

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